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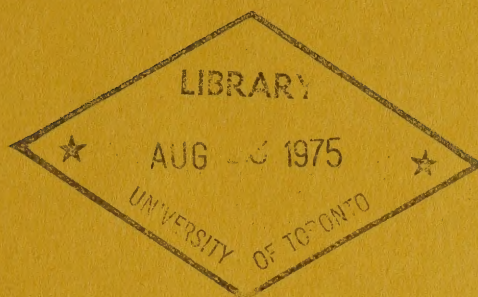
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# AN INTERIM REPORT ON INTER-CITY PASSENGER MOVEMENT IN CANADA

JUNE 1975







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AN INTERIM REPORT ON  
INTER-CITY PASSENGER MOVEMENT  
IN CANADA

JUNE 1975

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Ottawa, 1975

## FOREWORD

The material contained in this initial report on Inter-City Passenger Movement was prepared in the course of a review of transportation policy during 1974 and early 1975. It represents a first attempt to develop a comprehensive overview of inter-city passenger transportation in Canada, with the exception of ferry services, and it will be necessary to further refine and update the analysis as additional data become available. It is being released publicly at this time to indicate the analytical basis for the Government's review of transportation policy, and to serve as a basis for public discussion. It should be noted, however, that all of the views and recommendations set out in this Interim Report on Inter-City Passenger Movement do not necessarily reflect the views of the Government of Canada.

This report is a companion piece to the Interim Report on Freight Transportation, which is being published on the same basis.

Ministry of Transport,  
Ottawa  
June, 1975.



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## SECTION I: HISTORICAL SUMMARY

The first mechanical means of passenger transport introduced in Canada were the coastal and Great Lakes steamships which began to appear early in the nineteenth century. From the beginning, it was one of the most important functions of Canadian governments to provide the port facilities, wharfs, and canals to facilitate these movements. The first railways built in Canada, such as the Champlain and St. Lawrence in 1836, were constructed as shortcuts or portage links on water routes. It was only in the 1850's with the coming of the main railway lines such as the Grand Trunk that railways became the main mode of passenger travel. Over the years the high costs and low speeds of passenger ships have reduced their use until today the only services that exist are certain important ferry crossings and to remote communities.

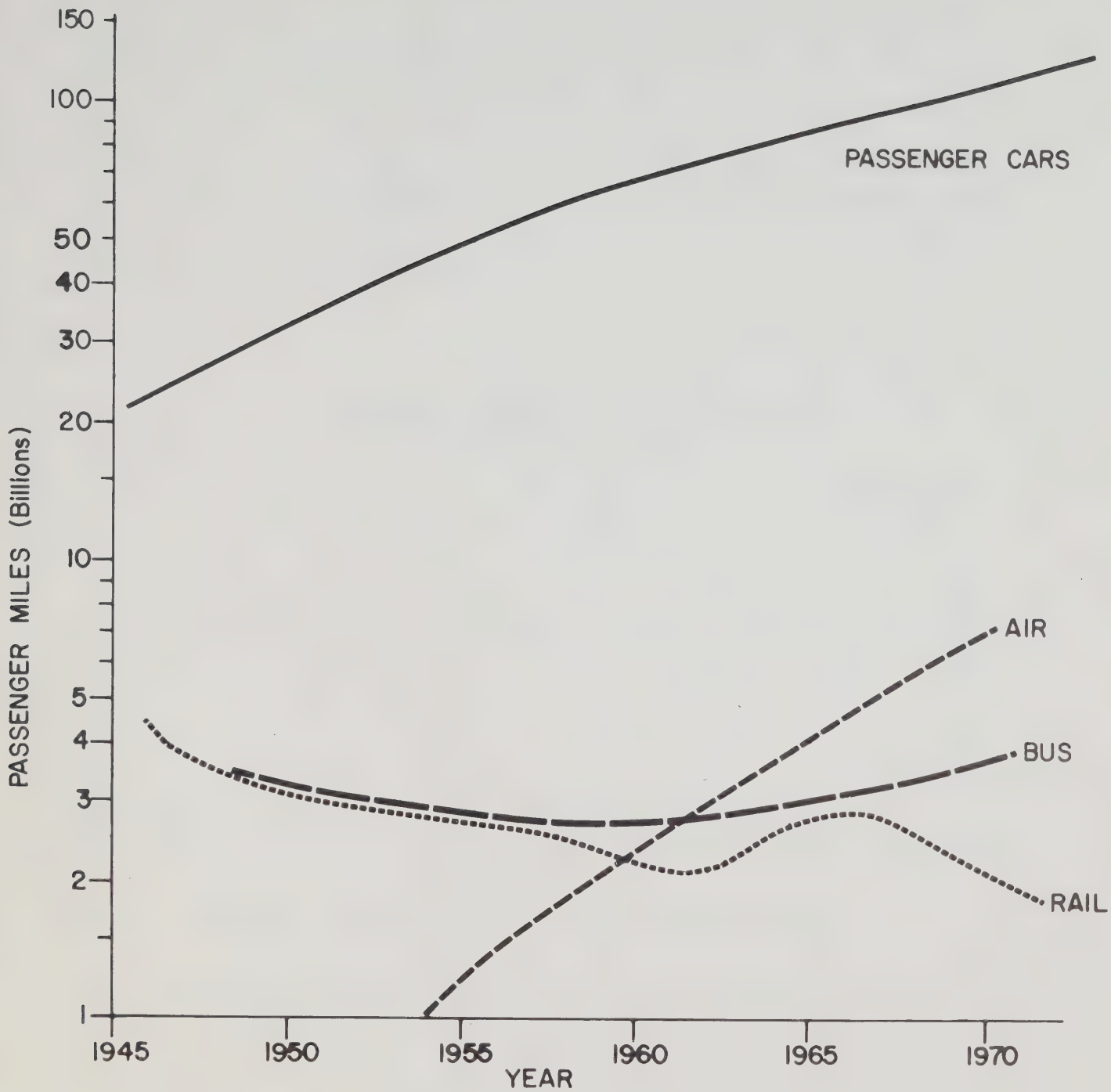
The dominance of the main line railways in intercity travel was first challenged by the interurban electric railway lines that were constructed from approximately 1890 to 1920, many of them as extension of urban street car networks. This mode of travel promised more operational flexibility with lower capital costs than the steam powered main lines. However, the introduction of private automobiles and buses after the First World War supplanted the role of the interurbans in the travel market and this mode of transportation has now completely disappeared in Canada.

Air travel was introduced between the two World Wars, the most important event being the formation of Trans-Canada Airlines by the federal government in 1937 when it was realized that private enterprise would not supply national air services.

During the Second World War the passenger rail system was called on to carry up to four times the load of the pre-war years because of gasoline rationing on private cars and legal restrictions on the length of haul of the bus companies.

Figure I - 1 indicates the trends in passenger mileage in Canada since the Second World War. There has been a steady increase in auto usage although air has shown the greatest proportional growth. Bus patronage declined in the first years of the period but is increasing again.

Rail patronage has been steadily declining, except during the passenger promotion campaign of CN in the mid 1960's, when rail travel increased temporarily. Recently, however, there has been some increase in rail passenger patronage particularly in Southern Ontario.



TRENDS IN PASSENGER MILES



SECTION II: PASSENGER MOVEMENT IN CANADA

The estimated 1972 and 1973 intercity passenger volumes are shown in Table II-1. The private automobile dominates the other modes. A similar dominance can be seen in Table II-2 which gives an estimate of family expenditure on transportation. This indicates that a relatively small modal shift from the private automobile would mean a large increase in the volumes carried by the "common carriers".

TABLE II-1

MAGNITUDE OF INTERCITY TRANSPORT MODES  
(all figures in millions)

|                  | Passengers |      | Passenger-Miles |         | Passenger Revenues |       |
|------------------|------------|------|-----------------|---------|--------------------|-------|
|                  | 1972       | 1973 | 1972            | 1973    | 1972               | 1973  |
| Air <sup>1</sup> | 13         | 16   | 13,000          | 18,000  | \$687              | \$813 |
| Rail             | 23         | 20   | 2,000           | 1,600   | \$ 79              | \$ 57 |
| Bus              | 32         | N/A  | 2,500           | N/A     | \$ 98              | N/A   |
| Automobile       | N/A        | N/A  | 75,000*         | 80,000* |                    |       |

Source: Statistics Canada Catalogues 51-002, 52-210, 53-215.

1 - Includes international services by Canadian carriers

N/A - Not Available

\* - Estimated

TABLE II-2  
ESTIMATED 1969 FAMILY EXPENDITURE  
ON TRANSPORTATION

|   | <u>Dollars</u> | <u>Percentage of<br/>Total Expenditure</u> |
|---|----------------|--|
| <u>Transportation Services</u>                            |                |  |
| Inter-City Carriers                                       |                |  |
| - train   | \$ 4.6         | -  |
| - bus   | 2.2            | -  |
| - air   | 39.3           | 0.4  |
| - movers  | 6.2            | -  |
| - others  | 2.7            | -  |
| TOTAL   | 55.0           | 0.6  |
| Local and Commuting Carriers                              | 39.8           | 0.4  |
|   | <hr/>          | <hr/>                                      |
| TOTAL SERVICES  | \$ 94.8        | 1.0  |
| <br><u>Car and Truck</u>                                  |                |  |
| Purchase  | 420.5          | 4.4  |
| Operations  | 566.5          | 5.9  |
|   | <hr/>          | <hr/>                                      |
| TOTAL   | 987.0          | 10.4                                       |
| <u>Other Transportation</u>                               | 106.9          | 1.1  |
| <u>Total Expenditure on Travel and<br/>Transportation</u> | \$1188.7       | 12.5                                       |

- Based on an urban "nuclear family" (2 adults, 2 children) with total expenditure of \$9,528.25.

Source: Statistics Canada Catalogue 62-535, p. 210-212.

Table II-3 shows that North Americans travel more per capita than the people of any other major region. Comparative figures are shown for North America, Europe and the World Average; Canadian figures are slightly lower than the North American, but the modal percentages are representative.

TABLE II-3  
ANNUAL PASSENGER - KILOMETRES PER CAPITA

| Region        | Mode | 1950  | 1955  | 1960  | 1965  | 1970  |
|---------------|------|-------|-------|-------|-------|-------|
| North America | Car  | 5,129 | 6,249 | 6,736 | 7,510 | 8,537 |
|               | Bus  | 767   | 681   | 594   | 551   | 571   |
|               | Rail | 275   | 228   | 157   | 124   | 80    |
|               | Air  | 83    | 174   | 235   | 412   | 721   |
| Europe        | Car  | 332   | 793   | 1,440 | 2,706 | 4,117 |
|               | Bus  | 741   | 675   | 622   | 682   | 711   |
|               | Rail | 631   | 698   | 703   | 715   | 715   |
|               | Air  | 11    | 29    | 56    | 103   | 183   |
| World         | Car  | 701   | 975   | 1,183 | 1,553 | 1,997 |
|               | Bus  | 326   | 346   | 370   | 446   | 481   |
|               | Rail | 310   | 357   | 374   | 392   | 397   |
|               | Air  | 14    | 31    | 54    | 91    | 161   |

Source: Transport and Road Research Laboratory, Report No. 622, 1974

This illustrates clearly the trend from rail towards air and car in North America in contrast to Europe where rail has increased slightly even though air and car have increased more than tenfold in 20 years. Both distance and affluence are taken to be major reasons for the differences.

The direct comparison between Canada and the United States, shown in Table II-4, indicates that, with approximately ten times the population, the United States has only a little over double the rail passenger-miles, ten times the bus passenger-miles and twelve times the air passenger-miles.

TABLE II-4

COMPARISON OF TRAVEL IN 1972  
(billions of Passenger-Miles)

|      | <u>Canada</u> | <u>United States</u> |
|------|---------------|----------------------|
| Air  | 13            | 152                  |
| Bus  | 2.5           | 25                   |
| Rail | 2.0           | 4.3                  |

Source: Canada - Statistics Canada Catalogues 51-002, 52-210, 53-215.

United States - Transportation Association of America,

Transportation Facts and Funds

SECTION III: PASSENGER TYPES: TRAVEL PEAKING

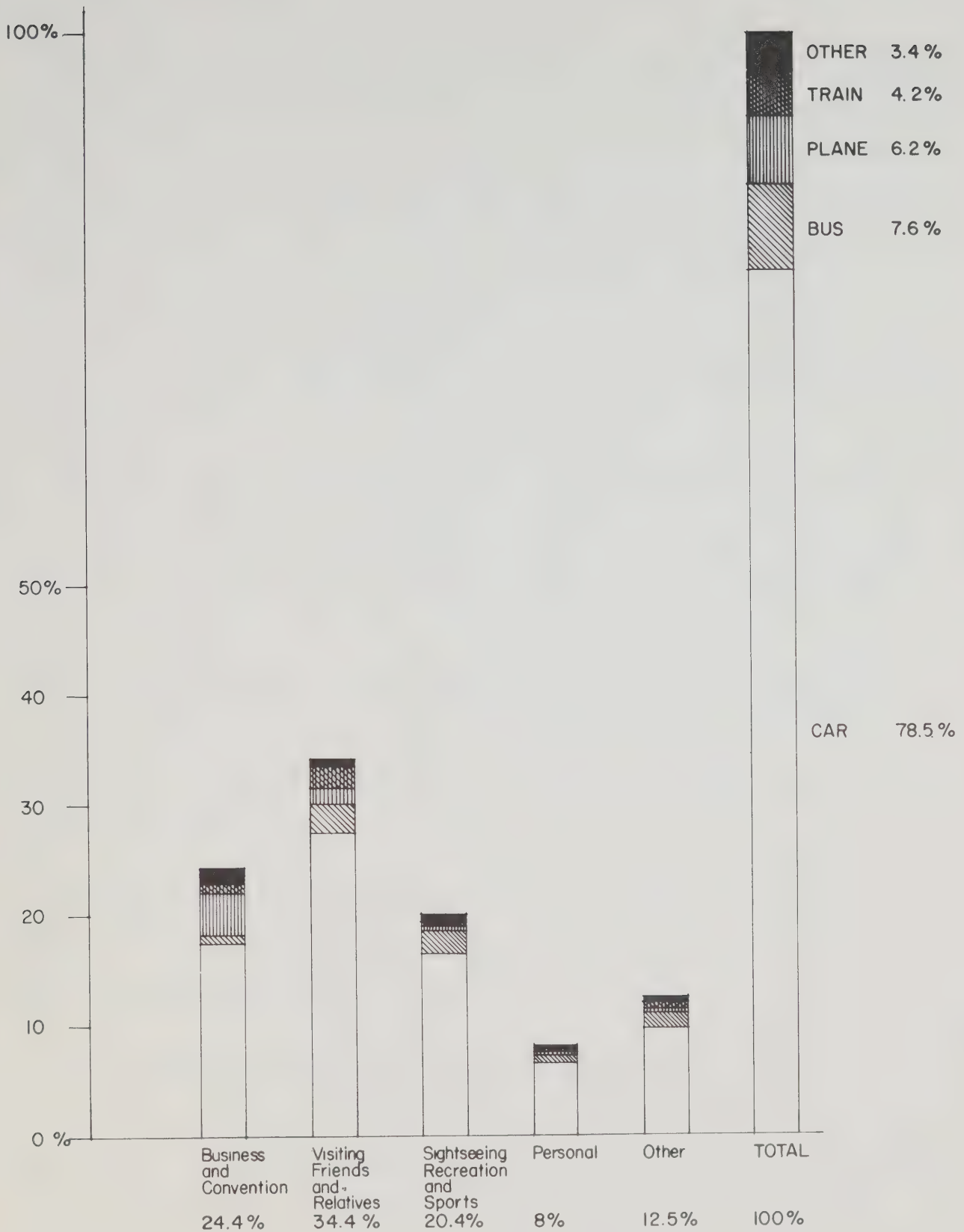
COMMERCIAL AND NON-COMMERCIAL TRAVEL

Passengers are divided into two categories - the business traveller and the non-business or leisure traveller. The business traveller is less interested in price than in time as reflected by speed, regularity, frequency and reliability of services, as well as in comfort and efficiency. Price may be significant, but these other characteristics determine which mode is chosen and create a demand for the type of service known as scheduled as opposed to non-scheduled or charter.

To the non-business or leisure traveller, price is more important, and consideration of other features - speed, comfort, etc. - varies directly according to income level.

The Canadian Travel Survey of 1971 as shown in Figure III-1, indicates that about 25% of inter-city trips in Canada of more than 100 miles are for business purposes; 75% are non-business. About 79% of all trips are made by private auto; bus accounts for 7.6%, air 6.8%, and train 4.2%. In terms of total movement (passenger-miles) air is the largest commercial mode, carrying over 7% compared to just under 3% for rail and about 5% for bus. The balance of 85% is carried by private auto. Automobile trips tend to be for shorter distances. As distance of trip increases, greater use is made of commercial carriers.





## DISTRIBUTION BY TRIP PURPOSE BY MODE



About 85% of business trips are made by auto, but in commercial services air carries more than bus and train combined. In the total non-business area, the bus is the leader in passenger trips, carrying about 11 people for every 7 by air and 7 by train. Again, when the distance factor is added and passenger-miles are measured, air becomes much larger than the other two modes.

The car is a little less important for vacation travel with 67% of trips by auto, 17% by plane, 7% by bus and 5% by train, although again, when distance is considered, air becomes more important.

There is a direct relationship between income and the mode of travel. While there are plenty of exceptions, on the whole more people of low income use the bus, while the middle income group tends to use rail and the people of higher income choose air travel, though there is a steady trend of all groups toward air travel. A similar pattern emerges in comparing scheduled and non-scheduled (or charter) service; the division between the travellers using each is, in part, related to income grouping, with higher income groups favouring scheduled service.

In personal travel, the largest single group is travelling to visit friends and relatives and the smaller segments represent vacations and personal travel for other reasons.

None of these categories are mutually exclusive; there is a great deal of overlapping. Individuals often combine two or more objectives during the same journey. In these cases the prime factor, in choice of mode, is whether one of the objectives is business, in which case more emphasis tends to be given to considerations other than price. However, more and more leisure

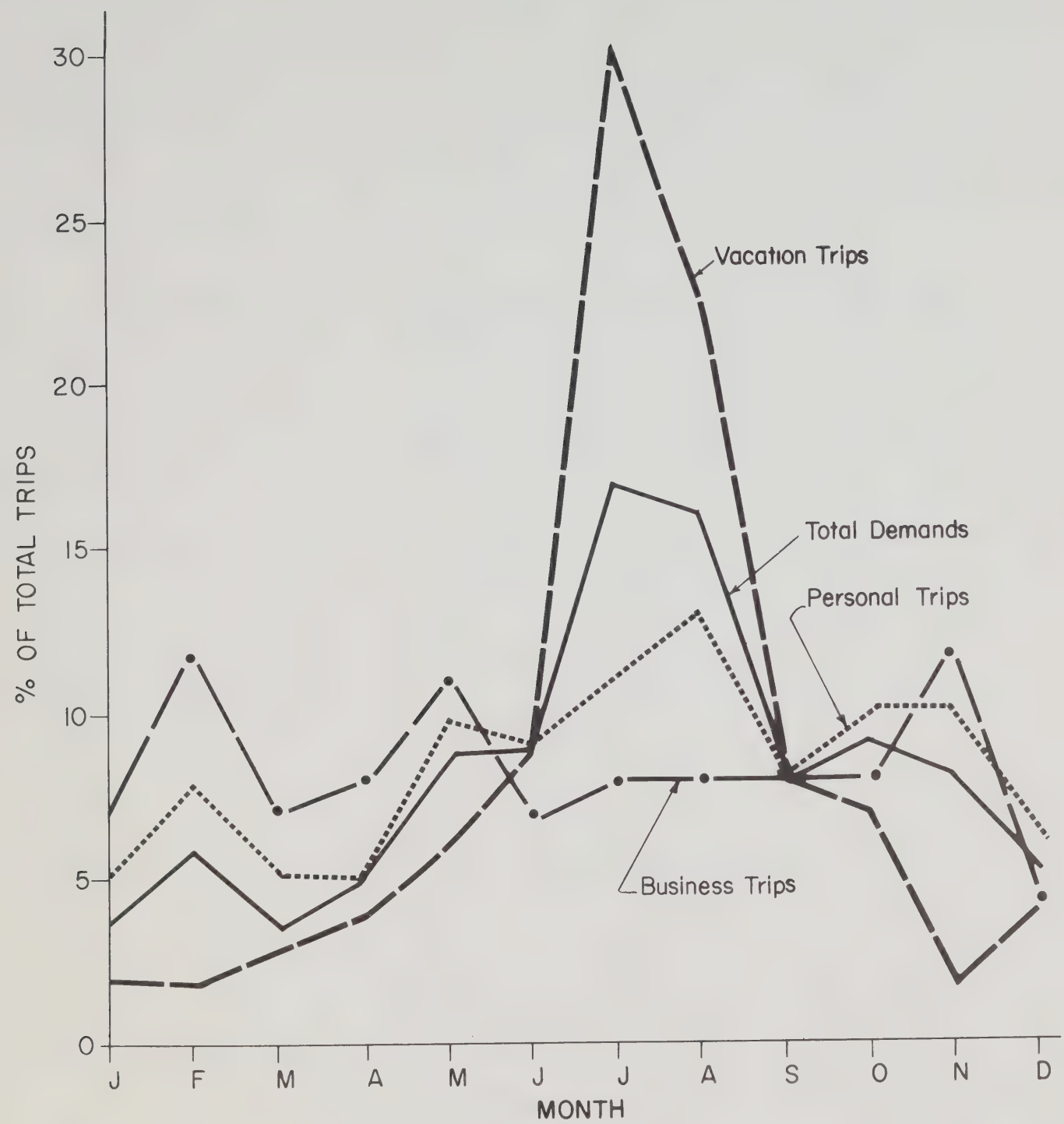
travellers, with time limitations applicable to vacations and income levels improving, are selecting more expensive but more rapid travel -- particularly for longer distances.

Finally, there is a changing relationship between the volume of business travel and the volume of non-business travel. The percentage of total air travel accounted for by leisure movement is growing rapidly and represents about one-third more than it did ten years ago. In the air mode leisure travel now represents over half the total number of passengers moved in any one year. Evidence indicates that this pattern is reflected in other modes of travel. Even on bus and rail modes, the relative position of leisure travel has been increasing.

#### SERVICE IMPLICATIONS

The increase in leisure travel has created a great problem for commercial carriers arising from the peaking characteristics. (See Figure III-2 from Department of Industry, Trade and Commerce Travel Industry Branch.)

The daily business peak - the morning and late afternoon rush hour - is a well-known characteristic of urban communities. In inter-urban travel, a weekly peak, especially in the air mode, develops from the tendency of business traffic to move on domestic services from Sunday evening through Monday, and again Thursday afternoon continuing through Friday. A week-end peak for leisure movement appears in lower-priced travel, the bus and rail modes, while the air mode feels the week-day business peak. The private auto, dominating all the other modes, reflects both types of weekly peak, but particularly week-end leisure movement.



SEASONAL PATTERNS - 1970



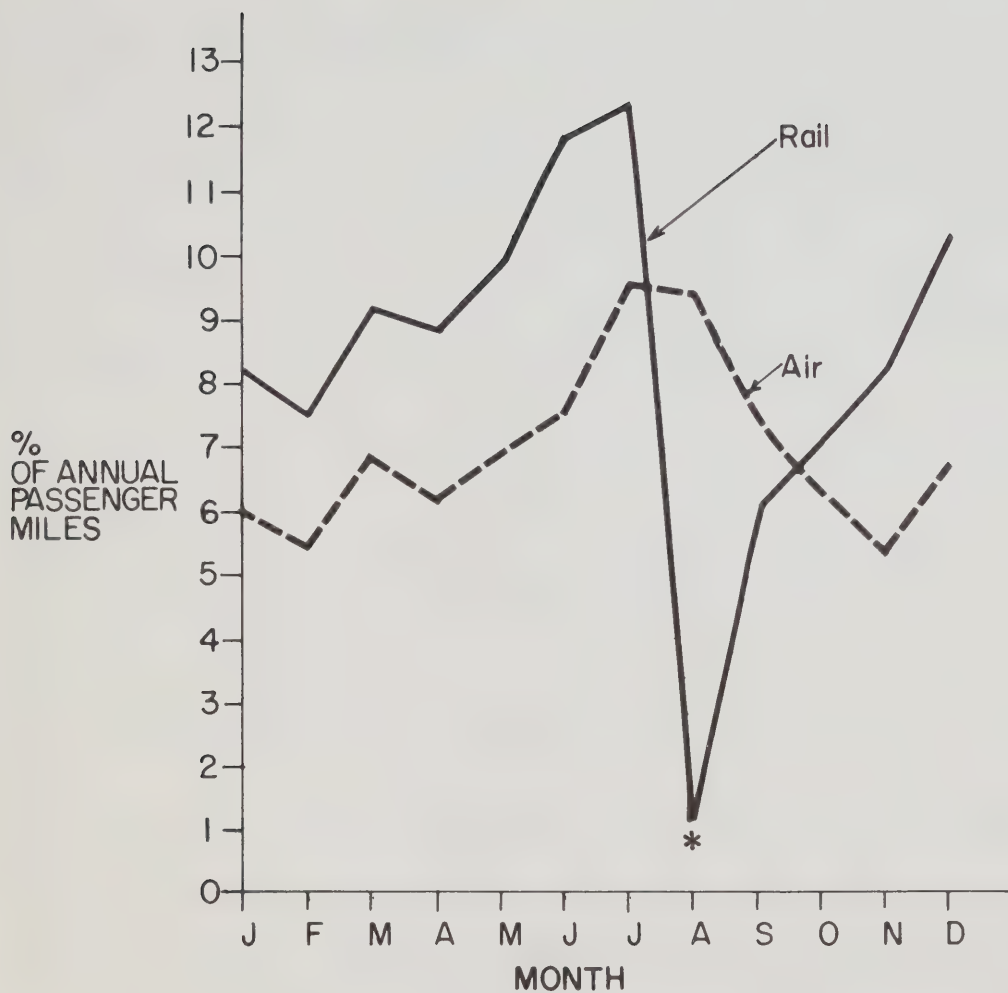
The significance of the annual peaking factor in Canadian traffic can be indicated by the fact that during February or October 65% to 90% of the passengers of a typical domestic air flight will be travelling for business. In summer air travel, particularly on the longer flights, business traffic may fall to 20% or 25%. Figure III-3 shows the monthly distribution of passenger-miles in 1973 for the rail and air modes.

The growing problem of seasonal peaking is reflected in a huge increase (the heaviest of all types of peaks) in the volume of summer traffic. Other pressures for service occur on holiday weekends throughout the year; and in some periods in winter when demand to "sun" destinations increases. The annual peak creates major pressures for the carrier, particularly in use and maintenance of equipment, overtime labour, problems, etc. No carrier can afford to cater fully to the summer peak unless prepared to have unused equipment during the rest of the year -- a very expensive solution. The winter peak can help partially if it is treated as part of total annual planning and in a sense "protected" for this purpose.

It is impossible to put a dollar figure on the cost to transportation of the effects of peaking, but there is no doubt that more even traffic flows would save costs and reduce fares.

Most carriers try to find some middle road which takes them somewhat beyond the capacity necessary for year-round steady business and gives reasonable chance to expand service during peak periods without ability to meet all peak demands. Many have been making steady progress in various devices designed to cope with this problem. Where feasible, equipment has been shifted to satisfy demands which occur at differing times between the various





\* Rail Strike

1973 RAIL AND AIR TRAVEL BY MONTH



cycles; thus, an aircraft with overseas as well as domestic capability, can be used to cover the different domestic and international weekly peaks, or even, because of varying time zones within Canada, to satisfy up to a point, varying daily peaks. There is a limit however, to the extent to which this can be done. Bus and rail both have some flexibility for this type of adjustment, with bus somewhat greater than rail, but neither as good as air.

The most common approach to the problem has been variable pricing. The C.N.R. red, white and blue fares are an example, and similar arrangements have been used by C.P.R. and by bus lines. The air mode has also used numerous variable pricing devices, either to drive people away from peaks or attract them to periods of lower traffic. However, while some success has been achieved, the limits imposed by climate and social habits remain.

The effects of the seasonal peaking, the largest of all the types of peaking, need to be considered in relation to three areas:

- (a) treatment of demand for leisure travel;
- (b) planning of infrastructure;
- (c) possibilities for long-term change.

Table III-1 gives some of the elasticities of travel demand against travel time and fare changes for each of the three modes on the Montreal-Toronto corridor. These were derived from a demand model produced for the C.T.C. Intercity Travel Demand Study. They indicate, for example, that if the scheduled air travel time were increased by 10 percent the demand for air travel in this corridor might be reduced by 6.2 percent, the rail and bus demand increased by 2.9 percent and the total common carrier demand reduced by 2.1 percent.

TABLE III - 1

Demand Model Point Elasticities

1. Montreal-Toronto

| Effect on<br>Volume of: | Schedule Time |       |       | Fare  |       |       |
|-------------------------|---------------|-------|-------|-------|-------|-------|
|                         | Air           | Rail  | Bus   | Air   | Rail  | Bus   |
| Air                     | -0.62         | 0.84  | 0.22  | -2.75 | 1.61  | 0.40  |
| Rail                    | 0.29          | -1.35 | 0.22  | 1.27  | -2.59 | 0.40  |
| Bus                     | 0.29          | 0.84  | -2.15 | 1.27  | 1.61  | -3.87 |
| Total                   | - .21         | 0.01  | 0.00  | -0.90 | 0.01  | 0.07  |

Source: Intercity Passenger Transport Study,  
Canadian Transport Commission  
September 1970

These figures do not include cross-elasticities to measure the effects of price and travel times changes on the automobile mode. These are being prepared as part of this policy review.

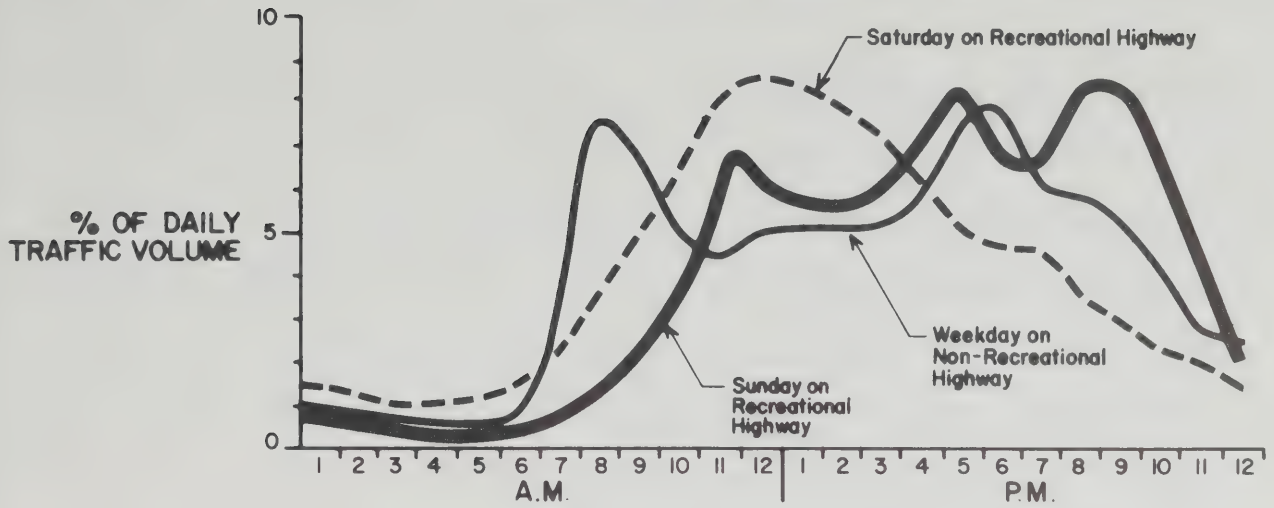
Road traffic also has significant peaking characteristics. These, of course, vary by location according to the type of traffic the highway is carrying. Figure III-4 indicates the seasonal, daily and hourly peaks for two highways in Ontario, one a recreational route and the other non-recreational (as reported by R.I. Wolfe, Parameters of Recreational Travel in Ontario, Geographic Review, Volume 54, No. 2).

#### LEISURE DEMAND

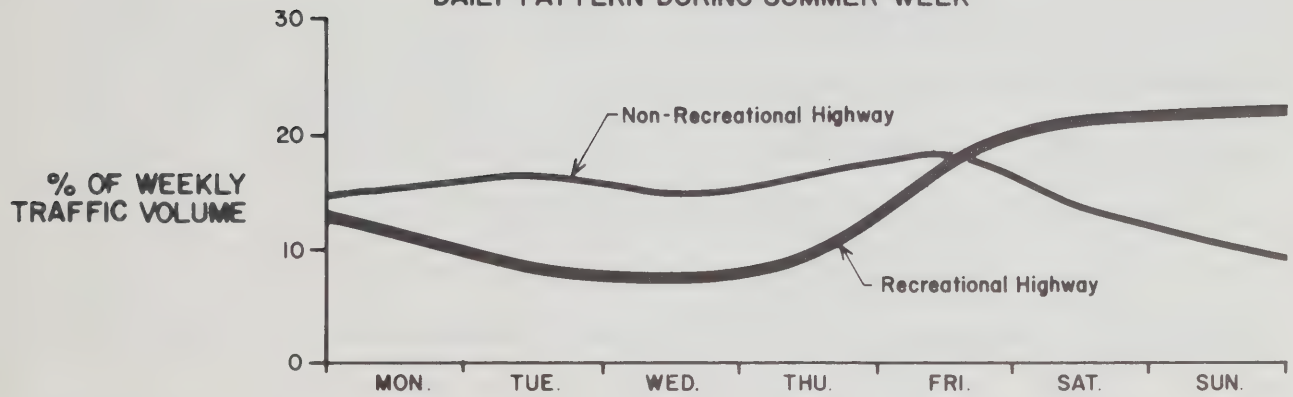
The seasonal peak is caused entirely by leisure or non-commercial demand. The balancing of this against demand for business travel is not easy but needs to be developed in relation to any transportation principles approved by the government as well as its priorities. The characteristics of scheduled service are required by a part of the market, in particular the business traveller, and also part of the leisure market. Emphasis on satisfying commercial demands for transportation before leisure needs implies some emphasis on scheduled service. While it is impossible to state that all business trips are more important than any leisure trips, in a broad sense leisure travel is made possible by a strong economic basis, and, in this sense, commercial travel generically must come before leisure travel. Unless business needs are satisfied, these will be a poor base for leisure travel.



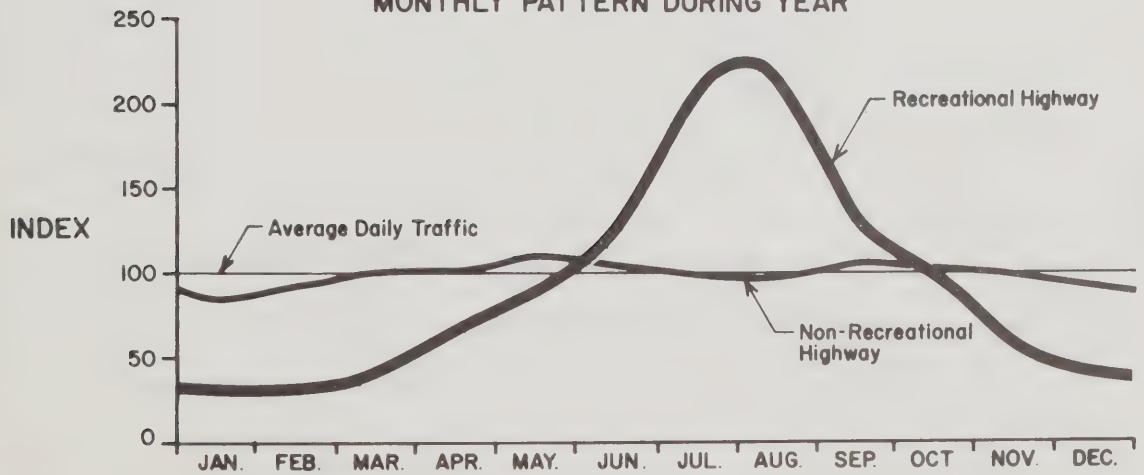
### HOURLY PATTERN DURING SUMMER DAY



### DAILY PATTERN DURING SUMMER WEEK



### MONTHLY PATTERN DURING YEAR



## COMPARISON OF TRAFFIC PATTERNS ON A RECREATIONAL AND A NON-RECREATIONAL HIGHWAY



Leisure demand, which is now the larger segment of the market and which is seasonal in needs, wants a low price. Catering to this demand can be done on scheduled service under certain types of pricing; and also by supplementary charters. Since the latter can draw some traffic from scheduled service, it becomes more difficult to maintain year-round scheduled service (particularly since the scheduled carriers' summer earnings normally carry them through winter loss periods). If however, protection to scheduled service is excessive, then response to the low-price seasonal market may be inadequate.

At present, this problem applies chiefly to international air services. Government policy regarding international scheduled service has been clearly established, but the balance between charter and scheduled flights and the responsibility of the scheduled carrier to serve the low-price market by charter or other equivalent price arrangement needs clarification; and there is a similar, as yet unexplored problem with regard to domestic air service.

#### RECOMMENDATIONS

1. Transportation services must provide adequate capacity to satisfy the total market, commercial and non-commercial, but in the broad sense described above, some priority should be given, where necessary, to the satisfaction of the business market.
2. Action to develop, starting with the air mode since it is under federal jurisdiction, a policy which encompasses both scheduled and charter service and provides guidelines for balance between the two.
3. In the longer run, some consideration of the implications of continuing to attempt to meet the steadily increasing service requirements for transportation at summer peak.

### PEAKING AND INFRASTRUCTURE PLANNING

Infrastructure capacity is provided in large steps and its average use by vehicles builds up gradually after each step until capacity is again fully used. In planning the particular volume of each step some measurement of potential demand has to be used. In the rail mode, capacity for freight movement will be the guiding factor. However, in the air and road modes, capacity is normally determined in terms of a figure somewhat below but fairly close to the peak demand.

If capacity is provided to meet a large portion of peak seasonal demand, and if the user charge aims at recovery of all or a substantial proportion of the cost of infrastructure provided by government, then the regular user outside the peak periods (primarily the business traveller) may have to subsidize the extra capacity maintained to satisfy a peak created by the leisure traveller. This situation is the reverse of any principle which suggests some priority for the capacity to satisfy business travellers.

### POSSIBILITY OF LONG TERM CHANGE

So long as the current social pattern of summer and school holidays remains, leisure traffic will peak at this time increasingly as leisure travel increases. Although variable pricing may achieve some changes these, so far, have not been as rapid as the growth of the peaking problem. It can be attacked only through cooperation of all levels of government; with industry making some structural changes once they realize the beneficial results that can be achieved in terms of rates and services.

An awareness of this has already emerged in the urban transit area and various experiments with staggered hours in more than one city have shown what can be done to alleviate the daily peaking problem. More can and should be achieved in this area.

Insofar as the weekly cycle is concerned, with limited results likely to be available in regard to the commercial sector, attention has to be focussed on the discretionary travel factor. An example would be the changes that might result from the gradual increase in the acceptance of the shorter work week especially if this could be combined with cycling the work week periods so that they did not fall on the same days. Some experiments in this direction have been undertaken.

The most important change to be sought however, remains in the annual peaking. There is already one good example of what might be a possible answer. Traditionally, the Easter school holiday week is a major peaking period for recreational travel straining equipment and resources of all modes. Recently, some provinces placed the Easter school holiday week earlier in the winter, while others kept to the traditional time. This resulted in two new air travel peaks, neither as severe as the former Easter peak. The result was that carriers were able to provide better service to everybody. To the extent that a variable pattern of this sort can emerge, better and cheaper transportation can be provided.

The most difficult peaking problem is set by the long summer holiday. This is tied into a traditional school pattern which emerged in this country partly because of climate, and partly because children were once needed to help with the planting and harvest. Today many people express concern with

the under-utilization of resources and consequential greater costs that result when schools stay empty for ten to twelve weeks during the summer. While recognizing the magnitude of the social change that would be involved, it is still worthwhile to point out that the Canadian climate does not require that the schools be closed for such a lengthy period in the summer; that other countries have developed school holiday patterns that provide for a shorter summer break and longer breaks at other periods of the year; and that any change that modified the present pattern of summer concentration which adds to the normal pressure of climatic changes on transportation, would create major possibilities for improved standards and reduce upward pressures on rates. A system which had three or four periods of holidays, closer to equal duration throughout the year would have this effect. If, in addition, these periods were not identical from province to province, the benefit would be even greater, given the flexibility that exists for transfers of equipment.

These suggestions are radical. Yet peaking has begun to be tackled at the urban transit level already, and provinces have achieved some variation in the traditional Easter holiday pattern. If the possible benefits are understood then some progress, slow and gradual, might be made in reducing peaks.

#### RECOMMENDATIONS

1. As a basic policy given the very great variations in the travel pattern, it would be unwise to adopt a policy that Canadian transportation should be expected to cater fully to these peaks. Without a great deal more detailed analysis, it would be impossible to determine whether any quantitative formula could be developed which would suggest target levels. This justifies further study.

2. Assuming some continuing forum for federal-provincial (and municipal) consultation on transportation emerges, a more detailed analysis of this subject along with educational effort aimed at long-term improvement by changing some of those conditions which can be adjusted and which create peaking should be undertaken.
3. Within the regulatory process, positive encouragement should be given to pricing and marketing programmes designed to level peaks. At the same time, off-peak users should not be forced to subsidize provision of capacity for the peak periods.

#### SECTION IV: SERVICE CHARACTERISTICS OF THE MODES

In addition to the prime factors of time and price, travellers react to a series of other characteristics. This section comments briefly on the performance of the modes of passenger travel in providing service.

##### COMFORT

Opinions vary widely as to the cost of comfortable mode of travel. The rail passengers has, at present, the best seat and leg area and the most mobility during a journey, excluding air first class. The bus passenger has the least advantage in this respect. The provision of meals and the availability of washrooms, etc. also vary: a few years ago a toilet on a bus was unusual; now it is commonplace; some railway and bus companies are trying to provide what they call an "aviation type" seat and serve an "airline type" meal. Such amenities are directly related to the marketing and pricing policies of the carrier itself and can vary or be comparable according to any particular set of circumstances. The mode which offers the largest amount of space to the economy passenger, the rail mode, has the poorest economic performance.

##### FLEXIBILITY

The main factors considered are flexibility in use and in acquisition of units. The rail mode has the least flexibility with the air mode and the bus mode having some unique and some comparable advantages. Rail is tied to a fixed rail bed and uses units of a large size, which are expensive to acquire and must be used within the consist of a train normally made up of several components. The bus has flexibility in the low cost of units and availability of a wide network of roads upon which to operate. The smaller size of the units themselves averaging 40 to 60 passengers even with some possibility of

some larger units within the next fifteen years, adds to this flexibility.

The aircraft has a greater degree of flexibility in use of units. It is not tied down to a rail bed or road and because of greater speed, can move vehicles rapidly over large distances to meet changing demand circumstances. It uses units that vary substantially in size, running from less than 40 passengers to the jumbo which can carry four hundred passengers. On the other hand, the cost of an aircraft is substantially higher than that of the motor coach and in this respect, the air is at a disadvantage compared to the bus.

#### RELIABILITY: SERVICE STANDARDS AND WEATHER

On-time performance as a feature of reliability is affected by four factors: the handling procedures used by the carrier; the efficiency of the carrier in performing these procedures; the general effect of traffic congestion (related in part to route or terminal facility capacity and in part to traffic control procedures); and responsiveness to weather conditions.

The first feature is basically a decision by the carrier and the mode. Air service grew on a system of controlled reservations to ensure load factors (a reflection of the need imposed by higher unit costs and the small capacity of early aircraft), with sophisticated baggage handling and special enroute service. Not only has this tradition added to its unit costs compared to other modes, but it has established a degree of expectation that exposes it to customer criticism that is less apparent in other modes with traditionally lower standards. At the same time that aviation is gradually reducing some of these service components, other modes have been experimenting with additional service features copied from airlines. Some total levelling out in terms of these service factors can be expected as part of the general market process. The edge at present rests with the air mode and probably will remain

there because of greater emphasis on the personal service concept, but mass demands are likely to force reduction in some of the customary "comfort standards in air".

Responsiveness to weather is also an element in reliability. Advantages and disadvantages vary according to mode and can be measured only in relation to particular situations and their frequency of recurrence in a given locality. Fog, freezing rain and heavy snow are the constraints. Airlines need to cope only with the situation at points of departure and arrival, since enroute the aircraft can rise above the weather (except for unpressurized aircraft). Road and rail must be able to cope over a whole route. Air as a mode can handle fog conditions as well or better than the ground modes, given the current blind landing techniques. In freezing rain, the rail mode has some advantage with air and road both at a disadvantage - the relative degree again being dependent on local severity. In extremely heavy snow, rail and buses on freeways will get through when air service is shut down, but with a time disadvantage due to enroute delays that can be offset by the time advantages of air when a terminal is re-opened.

These comments of course, apply to the road mode on major freeways where the best service in clearance is concentrated. The degree of weather interruption on other roads can be much greater and in general rail has to be given the advantage over road in response to extremely bad weather situations; and in periods of prolonged heavy snow an advantage over air in ability to keep moving, offset by the advantage air has of avoiding bad enroute conditions. The private automobile, in the sort of conditions described above, is the most vulnerable of all modes.

Measured in terms of total reliability Figure IV-I shows that, based on a 1969 survey in the central Canada corridor during a summer period, rail passenger service maintained the best on-time performance with air second and bus third. (Source: Intercity Passenger Transport Study, Canadian Passenger Transport Study, Canadian Transport Commission, 1970). To establish relative reliability on a broader basis a more extensive study would have to be undertaken.

### SAFETY

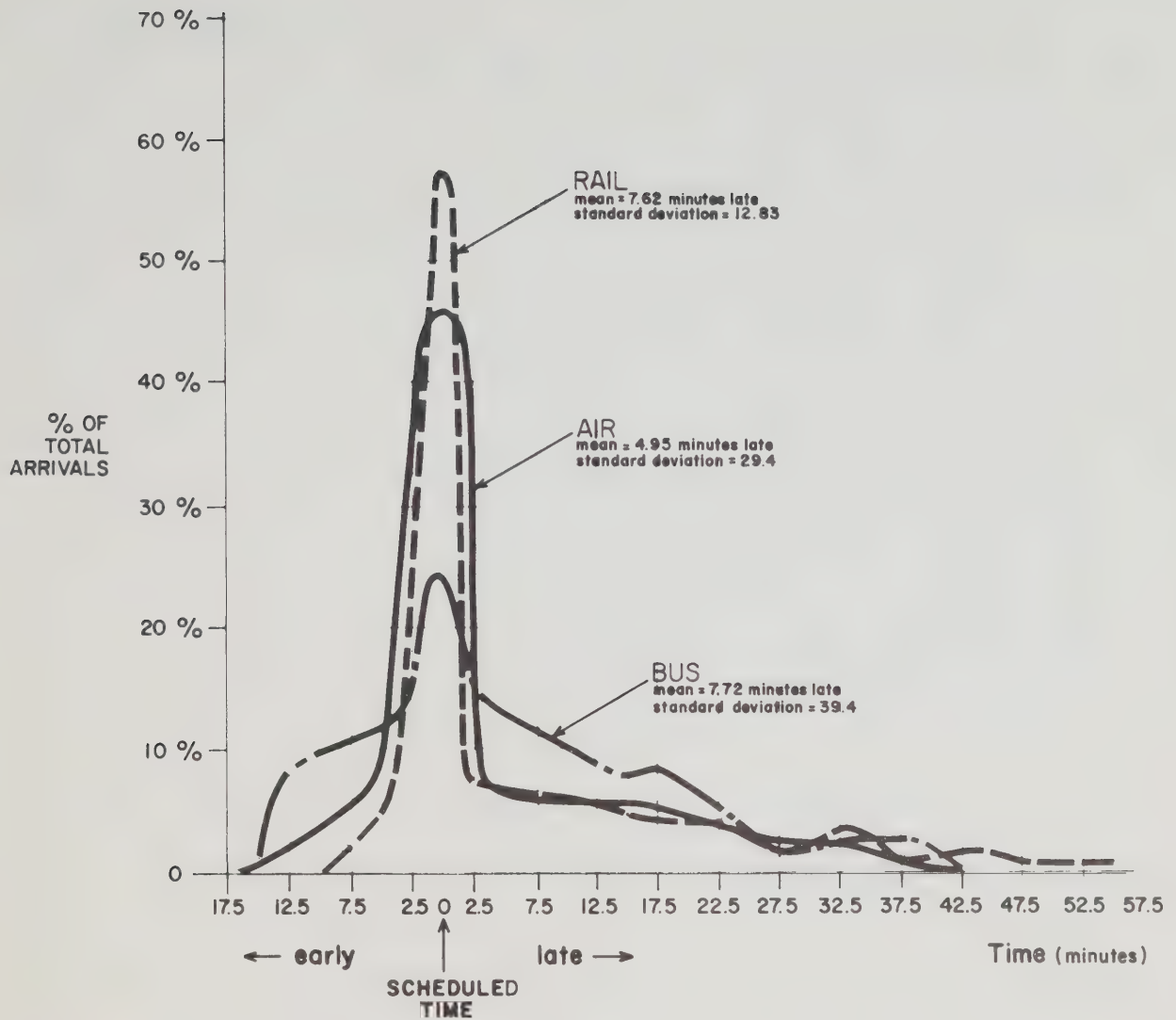
As shown in the Table IV-1 based on U.S. projections, and using passenger-miles travelled as the factor of measurement, the private automobile is by a large margin the most dangerous method of travel. The commercial modes are relatively close together in records compared to the auto, and rail has the best record with bus slightly better than air measured in terms of fatalities, but worse than air in terms of total injuries.

TABLE IV-I

| Mode       | Expected Rates of Passenger<br>Accidents for 1975 |          |
|------------|---|----------|
|            | 1975 rate per 100 million<br>passenger - miles    |          |
|            | Fatalities  | Injuries |
| Auto       | 2.40  | 85.4     |
| Bus        | 0.24  | 6.6      |
| CTOL       | 0.30  | 2.4      |
| STOL       | 0.60  | 4.9      |
| Rail (All) | 0.10  | 0.9      |
| TACV       | 0.08  | 0.4      |

Source: Intercity Passenger Transport Study,  
Canadian Transport Commission, 1970.





## COMPARISON OF ACTUAL AND SCHEDULED ARRIVAL TIMES

IV-1



## SECTION V: THE ENVIRONMENT AND THE USE OF RESOURCES

### 1. ENERGY REQUIREMENTS

Using a theoretically equal load factor for different modes, air consumes more energy for each seat-mile provided than any other mode, with the auto second, various versions of current rail propulsion third and the bus best. However, when this comparison is adjusted to take account of the low load factor in automobile travel, it becomes the worst performer. When to this is added the fact that it accounts for about 85% of passenger-mile travel, it obviously becomes the area offering greatest leverage.

At the other end of the scale, the motor coach, in addition to having the best basic performance, operates at a load factor that is better than the auto, a little better than rail, but not as good as air. Any encouragement or activity that increases use of this mode is desirable from the point of view of energy conservation.

The air mode operates in Canada at a substantially higher load factor than all other modes and this tends to move its resultant productive use of energy closer to the other modes.

The problem in setting objectives relating to energy use is the intermediate position of rail and air. The situation, with regard to the bus and the auto, is clear; the best and the worst.

Air is the dominant long-haul mode and likely to remain so. At short to medium ranges, rail sets its fare structure with bus fares in mind as a principal competitor. Encouragement of rail, which leads to transfer of traffic from bus to rail, hurts energy conservation. On the other hand, in these competitive ranges, if the air traveller shifts to rail, there is a saving of energy.

The best solution from the point of view of energy use in the competitive short and middle distance ranges is to let the commercial modes find a natural balance, each being used in the best fashion. Otherwise, special measures may achieve the wrong result by moving passengers from a more efficient to a less efficient mode.

In terms of the future, leaving aside rail electric, which would have great energy efficiency but is not an immediate prospect, the main technological improvements in energy efficiency are forecast for the auto and the aircraft - more than rail or bus. While the gaps between the modes will narrow in consequence, the order of listing will not change.

Figure V-1 is broadly indicative but has to be interpreted in the light of the above comments about load factors, competitive relationships and prospects for improvement.



# ENERGY USE



## 2. LAND REQUIREMENTS

### RAIL

A double track intercity rail line requires approximately 12 acres of land per mile of route. If 10 trains per day each way, each with 500 seats, were to use this line, then the ratio of total annual available seat-miles per acre would be approximately 150,000. This is an unachievable density in Canada at present with perhaps one exception. This contrasts with the existing ratio of available passenger seat-miles per acre for the entire Canadian rail system of 20,000.

### AIR

The air mode is different in that land is required only at the origin and destination airports. As an example, Toronto International Airport is said to have a practical capacity of approximately 12,500,000 departing seats per year and an area of approximately 4300 acres for a ratio of approximately 2900 departing seats per acre. If the average flight segment is 400 miles, the ratio of available seat-miles per acre becomes 1,160,000. If the average flight segment is only 100 miles, the corresponding ratio is 280,000 available seat-miles per acre.

The existing usage of several airports in Canada is shown in Table V-1.

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TABLE V-1

1973

| <u>AIRPORT</u> | <u>DEPARTING SEATS</u> | <u>ACREAGE</u> | <u>SEATS PER<br/>ACRE</u> | <u>ASM PER ACRE AT<br/>AVERAGE FLIGHT<br/>LENGTH OF 400 MILES</u> |
|----------------|------------------------|----------------|---------------------------|---|
| TORONTO        | 7,310,000              | 4,273          | 1,711                     | 684,000   |
| MONTREAL       | 6,676,000              | 4,504          | 1,482                     | 593,000   |
| WINNIPEG       | 1,543,000              | 3,770          | 409                       | 164,000   |
| REGINA         | 345,000*               | 1,287          | 268                       | 107,000   |

The average for Canada is approximately  
85,000 ASM per acre.

\* 1972

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AUTOMOBILE

Many four-lane inter-city highways carry more than 10,000 vehicles per day or 3,650,000 vehicles per year. The land required for a four-lane highway is approximately 20 acres per mile and, if each vehicle has four seats, the potential productivity in ASM/acre would be about 750,000. The actual productivity is about 130,000 available seat-miles per acre.

BUS

There is no experience with complete inter-city busways in the world but the practical capacity of a two-lane busway would be at least 300 buses in each direction per hour, far beyond the potential demand in any Canadian corridor. Although the comment is at present hypothetical a two-lane busway could probably match the capacity of a double track rail line.

## SUMMARY

Table V-2 gives a comparison of the potential and actual productivity of transport modes in terms of available seat-miles per acre. Although the air mode has the highest potential productivity in terms of land consumed, at present, the road system is actually more intensively used.

---

TABLE V-2

ASM/ACRE

|      | <u>POTENTIAL WITH HIGH<br/>UTILIZATION</u> | <u>ACTUAL CANADIAN<br/>AVERAGE USAGE</u> |
|------|--|--|
| Air  | 1,160,000                                  | 85,000                                   |
| Road | 750,000                                    | 130,000                                  |
| Rail | 300,000                                    | 20,000                                   |

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### 3. POLLUTION

Table V-3 indicates relative levels of emissions for various transportation modes on a seat-mile basis using data prepared some years ago in the U.S.A. Improvements in emission control particularly in the auto, and to some extent in air have changed the situation somewhat for the better in these modes but the figures are still broadly indicative. Again combining the auto data with its 85% role in total movement indicates the substantial leverage in this area.

In terms of future technical improvement more is expected in the auto mode than in any other with air also likely to see important improvements.

More detail will be developed in later reports.

TABLE V-3

(Total Pollutants per Seat-Mile by Mode)

| MODE         | CARBON<br>MONOXIDE | HYDROCARBONS | OXIDES OF<br>NITROGEN |
|--------------|--------------------|--------------|-----------------------|
| Automobile** | 120                | 12           | 4                     |
| Air          | 105                | 5            | -                     |
| Bus          | 3                  | 2            | 2                     |
| Rail         | 1                  | 1            | 1                     |

Sources: 1. Transportation Facts and Trends, Ninth Edition, 1972,  
Transportation Association of America.

2. Emissions from Combustion Engines and Their Control.  
D.J. Paterson and N.A. Nenein,  
Ann Arbor Science Publishers, 1972.

STOL was assumed to have a slightly higher pollution index than  
CTOL because of its higher energy requirements per seat-mile, and  
the "downtown" location of the airports.

\* Fossil-fuel thermal generating stations tend to contribute to  
atmospheric pollution. The relative amount of electrical power  
generated in this fashion is very small, however. In addition,  
since thermal generation of electric power is localized, steps  
to reduce emission levels can be readily undertaken.

\*\* Automobiles are the only mode to contribute significant lead-based  
emissions as well.

## SECTION VI: INFRASTRUCTURE AND CAPACITY

One intention of this review is to examine the likely relationship between volume and capacity over the next fifteen years. The purpose is to take advantage of any excess capacity that might exist within the transportation system to determine if the capacity available on any of the links of the network may create critical bottlenecks and not allow the efficient utilization of the network as a whole.

A model which will forecast travel demand and modal split is being prepared but is not yet available; therefore, the data on capacity is based primarily on extrapolations of existing demands. These trend projections assume the continuance of trends in other areas.

### RAILWAYS

Because the volume of rail passengers is actually declining in absolute numbers, a trend analysis would say that there should be no problem in the capacity of the rail system to handle the expected numbers of passengers. However, the growth in the demand for rail capacity for freight traffic may cause capacity limitations in certain areas of the country. According to the most recent projections of rail freight traffic, these capacity limitations may occur on the CN and CP lines between Alberta and Vancouver, and on certain lines between Winnipeg and Northern Ontario. None of these links is considered as a possible area for high speed rail innovations and therefore, it was concluded that, on a trend basis, there is no particular problem in passenger rail capacity.

In those areas of the country where rail passenger service may have greater economic justification, it was decided that it would be more realistic to analyze the capacity requirements of specific rail proposals in conjunction with the railways. This would occur after any potential markets for improved rail service have been identified in detail.

#### AIR

The Canadian Air Transport Administration (C.A.T.A.) has analyzed the demand and capacity for airports up to 1982. Aside from Toronto, Montreal, and Vancouver, there are no major runway and air navigation system capacity problems. In Toronto and Montreal, second airports are under construction to handle the additional traffic. Incremental improvements will also have to be made on terminal facilities in various airports across the country. C.A.T.A. expect to spend approximately \$300 million a year for capital expansion over the next few years.

It should be noted that the capacity requirements are based on the continuance of the existing peaking pattern. In other words, a much greater volume of traffic could be accommodated if methods of spreading seasonal, daily and hourly peaks were implemented.

#### ROAD

The Surface Administration performed an analysis of existing road capacity and volumes and then projected these volumes to 1982 to determine what capacity problems might arise if no improvements were made to the road system. On the defined national highway system, approximately 20 percent of the network in 1972 was found to have a relationship between peak demand and capacity in which the level of operation was determined to be "poor to good". (Table VI-1).

By 1982, if no improvements are made, 40% of the national network would be in this category, (Table VI-2). However, provincial governments have planned considerable expenditures on their highway systems. They anticipate spending approximately \$5,000 million over the period 1972-1982 on the primary national system. If this is extrapolated to 1990, the total highway expenditures over an 18 year period would be approximately \$9,350 million. Over the period 1972-1982, the Canadian Highways System Study estimated 63 percent of provincial highway expenditures would be on this primary highway network. If this same ratio were to hold for the entire period to 1990, the total highway expenditure would be in the order of approximately \$15,000 million or slightly less than \$1 billion per year. As indicated above, this is a straightforward trend projection, not a statement of what should happen.

These trends include increases in car ownership and increases in automobile mileage per person over the period. If anything happens to occur to change these trends, from increases in the price of gasoline, or in the price of cars, then a decrease in road capacity requirements will occur. Any spreading of the peaks experienced in highway traffic would also reduce the need for added capacity.

TABLE VI-1

1972 SUMMARY OF HIGHWAY TRAFFIC OPERATION BY PROVINCE

| PROVINCE                                | LEVEL OF OPERATION |     |       |     |           |     | TOTAL |
|---|--------------------|-----|-------|-----|-----------|-----|-------|
|   | GOOD-EXCELLENT     |     | GOOD  |     | POOR-GOOD |     |       |
|   | MILES              | %   | MILES | %   | MILES     | %   |       |
| B.C.                                    | 240                | 8   | 1915  | 68  | 667       | 24  | 2822  |
| National<br>Parks<br>(Banff/<br>Jasper) | 45                 | 36  | 70    | 56  | 10        | 8   | 125   |
| Alberta                                 | 550                | 34  | 910   | 56  | 160       | 10  | 1620  |
| Sask.                                   | 1775               | 100 | ---   | --- | ---       | --- | 1775  |
| Manitoba                                | 1434               | 96  | 64    | 4   | ---       | --- | 1498  |
| Ontario                                 | 1149               | 30  | 1060  | 28  | 1600      | 42  | 3809  |
| Quebec                                  | 3009               | 81  | 357   | 10  | 314       | 9   | 3680  |
| N.B.                                    | 318                | 46  | 142   | 20  | 232       | 34  | 692   |
| N.S.                                    | 356                | 47  | 313   | 42  | 86        | 11  | 755   |
| P.E.I.                                  | 51                 | 71  | 2     | 3   | 19        | 26  | 72    |
| Nfld.                                   | ---                | --- | 176   | 31  | 388       | 69  | 564   |
| TOTAL                                   | 8927               | 51  | 5006  | 29  | 3476      | 20  | 17412 |

TABLE VI-2

1982 SUMMARY OF HIGHWAY NETWORK TRAFFIC OPERATIONS BY PROVINCE

| PROVINCE                         | LEVEL OF OPERATION |    |       |    |           |     | TOTAL  |
|----------------------------------|--------------------|----|-------|----|-----------|-----|--------|
|                                  | GOOD-EXCELLENT     |    | GOOD  |    | POOR-GOOD |     |        |
|                                  | MILES              | %  | MILES | %  | MILES     | %   |        |
| B.C.                             | 160                | 6  | 1442  | 51 | 1220      | 43  | 2822   |
| National Parks<br>(Banff-Jasper) | ---                | -  | 45    | 36 | 80        | 64  | 125    |
| Alberta                          | 192                | 12 | 400   | 26 | 1028      | 63  | 1620   |
| Saskatchewan                     | 1725               | 97 | 50    | 3  | --        | —   | 1775   |
| Manitoba                         | 1161               | 78 | 273   | 18 | 64        | 4   | 1498   |
| Ontario                          | 480                | 13 | 411   | 11 | 2918      | 77  | 3809   |
| Quebec                           | 2174               | 59 | 618   | 17 | 888       | 24  | 3680   |
| N.B.                             | 123                | 18 | 97    | 14 | 472       | 68  | 692    |
| N.S.                             | 288                | 38 | 210   | 28 | 557       | 34  | 755    |
| P.E.I.                           | 17                 | 24 | 3     | 4  | 52        | 72  | 72     |
| Nfld.                            | --                 | —  | --    | -- | 564       | 100 | 564    |
| TOTAL                            | 6320               | 37 | 3549  | 20 | 7543      | 43  | 17,412 |

## SECTION VII: SUPPLY OF TRANSPORT SERVICES

As part of the Transportation Policy Review, a network of 94 nodes was defined to describe the inter-city passenger transport system in Canada. The network is being used to develop a quantitative evaluation of future passenger transport alternatives. One aspect of this evaluation is an analysis of existing services in order to identify regional or local disparities in either service availability or accessibility to other nodes.

### SERVICE AVAILABILITY

Table VII-1 shows 1972 service frequencies into and out of each of the 94 nodes for the defined network. The figures represent weekly arrivals and departures for each of the nodes. These frequencies vary from 4515 for Toronto to 28 for Gaspé with lower figures for some border crossing points. Table VII-2 shows, by province, the number of modes serving the centres in that province.

There is a broad relation between the population of a centre and the frequency of service provided. Figures VII-1 through VII-4 illustrate these relationships but do not include the nine largest cities. Each graph shows a rapid increase of frequency with population for the smaller centres, leveling off in the medium population range. Although not shown on the graphs, the frequencies increase in the high population range over 400,000. In an attempt to identify disparities, a band was constructed on either side of the curve and cities lying outside of this range were identified.

TABLE VII-1

1972 PUBLIC TRANSPORT MODAL FREQUENCY

| NODE               | POP'N.  | /----BUS---- |      |      | /---RAIL--- |     |     | /----AIR---- |     |      | /--ALL MODES/ |      |      |
|--------------------|---------|--------------|------|------|-------------|-----|-----|--------------|-----|------|---------------|------|------|
|                    |         | OUT          | IN   | TOT  | OUT         | IN  | TOT | OUT          | IN  | TOT  | OUT           | IN   | TOT  |
| 1 ST. JOHN'S       | 131814  | 28           | 28   | 56   | 0           | 0   | 0   | 45           | 49  | 94   | 73            | 77   | 150  |
| 2 GR FALLS/WINDSOR | 14321   | 56           | 56   | 112  | 0           | 0   | 0   | 0            | 0   | 0    | 56            | 56   | 112  |
| 3 CORNER BROOK     | 38368   | 56           | 56   | 112  | 0           | 0   | 0   | 32           | 26  | 58   | 88            | 82   | 170  |
| 4 SYDNEY           | 91162   | 28           | 28   | 56   | 14          | 14  | 28  | 46           | 47  | 93   | 88            | 89   | 177  |
| 5 TRURO            | 13047   | 56           | 56   | 112  | 56          | 56  | 112 | 0            | 0   | 0    | 112           | 112  | 224  |
| 6 HALIFAX/DARTMOUT | 222637  | 42           | 42   | 84   | 42          | 43  | 85  | 153          | 159 | 312  | 237           | 244  | 481  |
| 7 CHARLOTTETOWN    | 25253   | 7            | 7    | 14   | 0           | 0   | 0   | 28           | 28  | 56   | 35            | 35   | 70   |
| 8 MONCTON          | 71416   | 78           | 78   | 156  | 49          | 49  | 98  | 69           | 66  | 135  | 196           | 193  | 389  |
| 9 SAINT JOHN       | 106744  | 68           | 68   | 136  | 35          | 34  | 69  | 70           | 77  | 147  | 173           | 179  | 352  |
| 0 FREDRICKTON      | 37684   | 56           | 56   | 112  | 14          | 14  | 28  | 74           | 74  | 148  | 144           | 144  | 288  |
| 1 CHATHAM/NEWCASTL | 14293   | 35           | 35   | 70   | 28          | 28  | 56  | 9            | 9   | 18   | 72            | 72   | 144  |
| 2 BATHURST         | 16674   | 19           | 19   | 38   | 28          | 28  | 56  | 18           | 18  | 36   | 65            | 65   | 130  |
| 3 YARMOUTH         | 8516    | 21           | 21   | 42   | 15          | 15  | 30  | 7            | 7   | 14   | 43            | 43   | 86   |
| 4 N GLASGOW/STELLA | 23435   | 35           | 35   | 70   | 28          | 28  | 56  | 0            | 0   | 0    | 63            | 63   | 126  |
| 5 GANDER           | 7748    | 56           | 56   | 112  | 0           | 0   | 0   | 47           | 49  | 96   | 103           | 105  | 208  |
| 6 CAMPBELLTON      | 10335   | 26           | 26   | 52   | 28          | 28  | 56  | 18           | 18  | 36   | 72            | 72   | 144  |
| 7 EDMUNDSTON       | 12365   | 42           | 42   | 84   | 14          | 14  | 28  | 0            | 0   | 0    | 56            | 56   | 112  |
| 8 MONTREAL         | 2743208 | 708          | 708  | 1416 | 165         | 172 | 337 | 540          | 526 | 1066 | 1413          | 1406 | 2819 |
| 9 ST. HYACINTHE    | 39693   | 152          | 152  | 304  | 63          | 63  | 126 | 0            | 0   | 0    | 215           | 215  | 430  |
| 0 DRUMMONDVILLE    | 46524   | 149          | 149  | 298  | 48          | 48  | 96  | 0            | 0   | 0    | 197           | 197  | 394  |
| 1 SHERBROOKE       | 84570   | 216          | 216  | 432  | 21          | 21  | 42  | 0            | 0   | 0    | 237           | 237  | 474  |
| 2 THETFORD MINES   | 26126   | 65           | 65   | 130  | 0           | 0   | 0   | 0            | 0   | 0    | 65            | 65   | 130  |
| 3 TROIS RIV/SHAWIN | 154293  | 195          | 195  | 390  | 40          | 40  | 80  | 0            | 0   | 0    | 235           | 235  | 470  |
| 4 QUEBEC           | 480502  | 346          | 346  | 692  | 101         | 96  | 197 | 124          | 139 | 263  | 571           | 581  | 1152 |
| 5 LA TUQUE         | 13099   | 31           | 31   | 62   | 12          | 26  | 38  | 0            | 0   | 0    | 43            | 57   | 100  |
| 6 CHICOUTIMI/JONQU | 133703  | 41           | 41   | 82   | 9           | 9   | 18  | 26           | 24  | 50   | 76            | 74   | 150  |
| 7 VAL D'OR         | 17421   | 91           | 91   | 182  | 6           | 6   | 12  | 20           | 20  | 40   | 117           | 117  | 234  |
| 8 RIVIERE DU LOUP  | 12760   | 126          | 126  | 252  | 46          | 51  | 97  | 0            | 0   | 0    | 172           | 177  | 349  |
| 9 RIMOUSKI         | 35654   | 54           | 54   | 108  | 44          | 44  | 88  | 35           | 29  | 64   | 133           | 127  | 260  |
| 0 B COMEAU/HAUTER  | 25290   | 14           | 14   | 28   | 0           | 0   | 0   | 28           | 27  | 55   | 42            | 41   | 83   |
| 1 SEPT ILES        | 24320   | 0            | 0    | 0    | 0           | 0   | 0   | 39           | 43  | 82   | 39            | 43   | 82   |
| 2 GASPE            | 17211   | 7            | 7    | 14   | 7           | 7   | 14  | 0            | 0   | 0    | 14            | 14   | 28   |
| 3 ROUYN/NORANDA    | 28562   | 91           | 91   | 182  | 13          | 13  | 26  | 19           | 19  | 38   | 123           | 123  | 246  |
| 4 CORNWALL         | 47116   | 98           | 98   | 196  | 42          | 42  | 84  | 0            | 0   | 0    | 140           | 140  | 280  |
| 5 OTTAWA/HULL      | 602510  | 365          | 365  | 730  | 92          | 85  | 177 | 250          | 262 | 512  | 707           | 712  | 1419 |
| 6 BROCKVILLE       | 19765   | 67           | 67   | 134  | 63          | 63  | 126 | 0            | 0   | 0    | 130           | 130  | 260  |
| 7 KINGSTON         | 85877   | 193          | 193  | 386  | 48          | 48  | 96  | 0            | 0   | 0    | 241           | 241  | 482  |
| 8 BELLEVIL/TRENTON | 63778   | 48           | 48   | 96   | 54          | 47  | 101 | 0            | 0   | 0    | 102           | 95   | 197  |
| 9 PETERBOROUGH     | 63531   | 105          | 105  | 210  | 7           | 7   | 14  | 0            | 0   | 0    | 112           | 112  | 224  |
| 0 OSHAWA/WHITRY    | 120318  | 320          | 320  | 640  | 47          | 48  | 95  | 0            | 0   | 0    | 367           | 368  | 735  |
| 1 TORONTO/MISSISSA | 2628043 | 1152         | 1152 | 2304 | 214         | 220 | 434 | 877          | 899 | 1776 | 2243          | 2271 | 4514 |
| 2 HAMILTON         | 498523  | 618          | 618  | 1236 | 126         | 126 | 252 | 266          | 279 | 545  | 1010          | 1023 | 2033 |
| 3 ST CATHS/NIAGRA  | 280316  | 309          | 309  | 618  | 21          | 21  | 42  | 0            | 0   | 0    | 330           | 330  | 660  |
| 4 KITCHENER/WATERL | 226846  | 209          | 209  | 418  | 51          | 51  | 102 | 0            | 0   | 0    | 260           | 260  | 520  |
| 5 LONDON           | 286011  | 149          | 149  | 298  | 158         | 166 | 324 | 67           | 62  | 129  | 374           | 377  | 751  |
| 6 SARNIA           | 78444   | 26           | 26   | 52   | 28          | 20  | 48  | 6            | 10  | 16   | 60            | 56   | 116  |
| 7 CHATHAM          | 35317   | 62           | 62   | 124  | 56          | 56  | 112 | 0            | 0   | 0    | 118           | 118  | 236  |
| 8 WINDSOR          | 258643  | 58           | 58   | 116  | 28          | 28  | 56  | 56           | 53  | 109  | 142           | 139  | 281  |
| 9 BARRIE           | 38176   | 186          | 186  | 372  | 32          | 32  | 64  | 0            | 0   | 0    | 218           | 218  | 436  |

TABLE VII-1 (Cont'd)

1972 PUBLIC TRANSPORT MODAL FREQUENCY

| NODE                | POP'N.  | /---BUS---/ |     |     | /---RAIL---/ |    |     | /---AIR---/ |     |     | /---ALL MODES/ |     |      |
|---------------------|---------|-------------|-----|-----|--------------|----|-----|-------------|-----|-----|----------------|-----|------|
|                     |         | OUT         | IN  | TOT | OUT          | IN | TOT | OUT         | IN  | TOT | OUT            | IN  | TOT  |
| 50 PEMBROKE         | 16544   | 69          | 69  | 138 | 28           | 28 | 56  | 10          | 10  | 20  | 107            | 107 | 214  |
| 51 NORTH BAY        | 49187   | 130         | 130 | 260 | 58           | 58 | 116 | 33          | 33  | 66  | 221            | 221 | 442  |
| 52 SUDBURY          | 155424  | 98          | 98  | 196 | 52           | 49 | 101 | 69          | 61  | 130 | 219            | 208 | 427  |
| 53 SAULT STE. MARIE | 81270   | 55          | 55  | 110 | 7            | 7  | 14  | 46          | 32  | 78  | 108            | 94  | 202  |
| 54 F ERIE/WELLAND   | 23113   | 116         | 116 | 232 | 7            | 7  | 14  | 0           | 0   | 0   | 123            | 123 | 246  |
| 55 KIRKLAND LAKE    | 27427   | 70          | 70  | 140 | 14           | 14 | 28  | 18          | 24  | 42  | 102            | 108 | 210  |
| 56 TIMMINS          | 28542   | 45          | 45  | 90  | 7            | 7  | 14  | 27          | 27  | 54  | 79             | 79  | 158  |
| 57 KAPUSKASING      | 12834   | 28          | 28  | 56  | 27           | 13 | 40  | 0           | 0   | 0   | 55             | 41  | 96   |
| 58 THUNDER BAY      | 112093  | 54          | 54  | 108 | 17           | 17 | 34  | 61          | 42  | 103 | 132            | 113 | 245  |
| 59 WINNIPEG/SELKIRK | 549593  | 136         | 136 | 272 | 46           | 54 | 100 | 251         | 249 | 500 | 433            | 439 | 872  |
| 60 PORTAGE LA PRAIR | 12950   | 133         | 133 | 266 | 51           | 42 | 93  | 0           | 0   | 0   | 184            | 175 | 359  |
| 61 BRANDON          | 31150   | 108         | 108 | 216 | 30           | 33 | 63  | 10          | 10  | 20  | 148            | 151 | 299  |
| 62 THOMPSON         | 19001   | 14          | 14  | 28  | 5            | 6  | 11  | 20          | 13  | 33  | 39             | 33  | 72   |
| 63 KENORA           | 10952   | 47          | 47  | 94  | 14           | 14 | 28  | 15          | 15  | 30  | 76             | 76  | 152  |
| 64 SASKATOON        | 126449  | 120         | 120 | 240 | 30           | 30 | 60  | 79          | 78  | 157 | 229            | 228 | 457  |
| 65 REGINA           | 140734  | 122         | 122 | 244 | 21           | 21 | 42  | 78          | 79  | 157 | 221            | 222 | 443  |
| 66 YORKTON/MELVILLE | 18805   | 60          | 60  | 120 | 19           | 16 | 35  | 0           | 0   | 0   | 79             | 76  | 155  |
| 67 MOOSE JAW        | 31854   | 94          | 94  | 188 | 14           | 14 | 28  | 0           | 0   | 0   | 108            | 108 | 216  |
| 68 SWIFT CURRENT    | 15415   | 75          | 75  | 150 | 14           | 14 | 28  | 0           | 0   | 0   | 89             | 89  | 178  |
| 69 PRINCE ALBERT    | 28464   | 28          | 28  | 56  | 7            | 7  | 14  | 10          | 10  | 20  | 45             | 45  | 90   |
| 70 NORTH BATTLEFORD | 14501   | 39          | 39  | 78  | 7            | 7  | 14  | 0           | 0   | 0   | 46             | 46  | 92   |
| 71 FLIN FLON        | 9344    | 21          | 21  | 42  | 1            | 2  | 3   | 18          | 23  | 41  | 40             | 46  | 86   |
| 72 LLOYDMINSTER     | 8691    | 39          | 39  | 78  | 14           | 14 | 28  | 0           | 0   | 0   | 53             | 53  | 106  |
| 73 VICTORIA         | 195800  | 105         | 105 | 210 | 13           | 13 | 26  | 72          | 72  | 144 | 190            | 190 | 380  |
| 74 VANCOUVER        | 1072003 | 231         | 231 | 462 | 38           | 40 | 78  | 328         | 303 | 631 | 597            | 574 | 1171 |
| 75 NANAIMO          | 38760   | 96          | 96  | 192 | 13           | 13 | 26  | 0           | 0   | 0   | 109            | 109 | 218  |
| 76 PRINCE RUPERT    | 15747   | 14          | 14  | 28  | 2            | 5  | 7   | 19          | 19  | 38  | 35             | 38  | 73   |
| 77 TERRACE/KITIMAT  | 21794   | 28          | 28  | 56  | 7            | 7  | 14  | 18          | 25  | 43  | 53             | 60  | 113  |
| 78 PRINCE GEORGE    | 49100   | 58          | 58  | 116 | 11           | 10 | 21  | 48          | 54  | 102 | 117            | 122 | 239  |
| 79 DAWSON CREEK     | 11855   | 56          | 56  | 112 | 2            | 2  | 4   | 9           | 8   | 17  | 67             | 66  | 133  |
| 80 KAMLOOPS         | 43790   | 112         | 112 | 224 | 39           | 35 | 74  | 44          | 40  | 84  | 195            | 187 | 382  |
| 81 KELOWNA/VERNON   | 50239   | 70          | 70  | 140 | 0            | 0  | 0   | 39          | 46  | 85  | 109            | 116 | 225  |
| 82 PENTICTON        | 18146   | 77          | 77  | 154 | 0            | 0  | 0   | 37          | 30  | 67  | 114            | 107 | 221  |
| 83 CRANBROOK        | 19641   | 42          | 42  | 84  | 0            | 0  | 0   | 21          | 20  | 41  | 63             | 62  | 125  |
| 84 JASPER(NAT.PARK) | 3064    | 36          | 36  | 72  | 19           | 21 | 40  | 0           | 0   | 0   | 55             | 57  | 112  |
| 85 BANF(NAT.PARK)   | 3532    | 84          | 84  | 168 | 14           | 14 | 28  | 0           | 0   | 0   | 98             | 98  | 196  |
| 86 GRANDE PRAIRIE   | 13079   | 42          | 42  | 84  | 4            | 4  | 8   | 18          | 18  | 36  | 64             | 64  | 128  |
| 87 EDMONTON         | 495702  | 168         | 168 | 336 | 37           | 37 | 74  | 189         | 193 | 382 | 394            | 398 | 792  |
| 88 RED DEER         | 27674   | 98          | 98  | 196 | 24           | 24 | 48  | 30          | 30  | 60  | 152            | 152 | 304  |
| 89 CALGARY          | 403319  | 255         | 255 | 510 | 26           | 26 | 52  | 290         | 279 | 569 | 571            | 560 | 1131 |
| 90 LFTHBRIDGE       | 41217   | 60          | 60  | 120 | 0            | 0  | 0   | 46          | 46  | 92  | 106            | 106 | 212  |
| 91 MEDICINE HAT     | 26518   | 77          | 77  | 154 | 14           | 14 | 28  | 19          | 19  | 38  | 110            | 110 | 220  |
| 92 NFLSON/TRAIL/CAS | 27517   | 35          | 35  | 70  | 0            | 0  | 0   | 9           | 17  | 26  | 44             | 52  | 96   |
| 93 FORT ST.JOHN     | 8264    | 21          | 21  | 42  | 0            | 0  | 0   | 21          | 22  | 43  | 42             | 43  | 85   |
| 94 WHITE ROCK       | 10349   | 0           | 0   | 0   | 7            | 7  | 14  | 0           | 0   | 0   | 7              | 7   | 14   |

TABLE VII-2

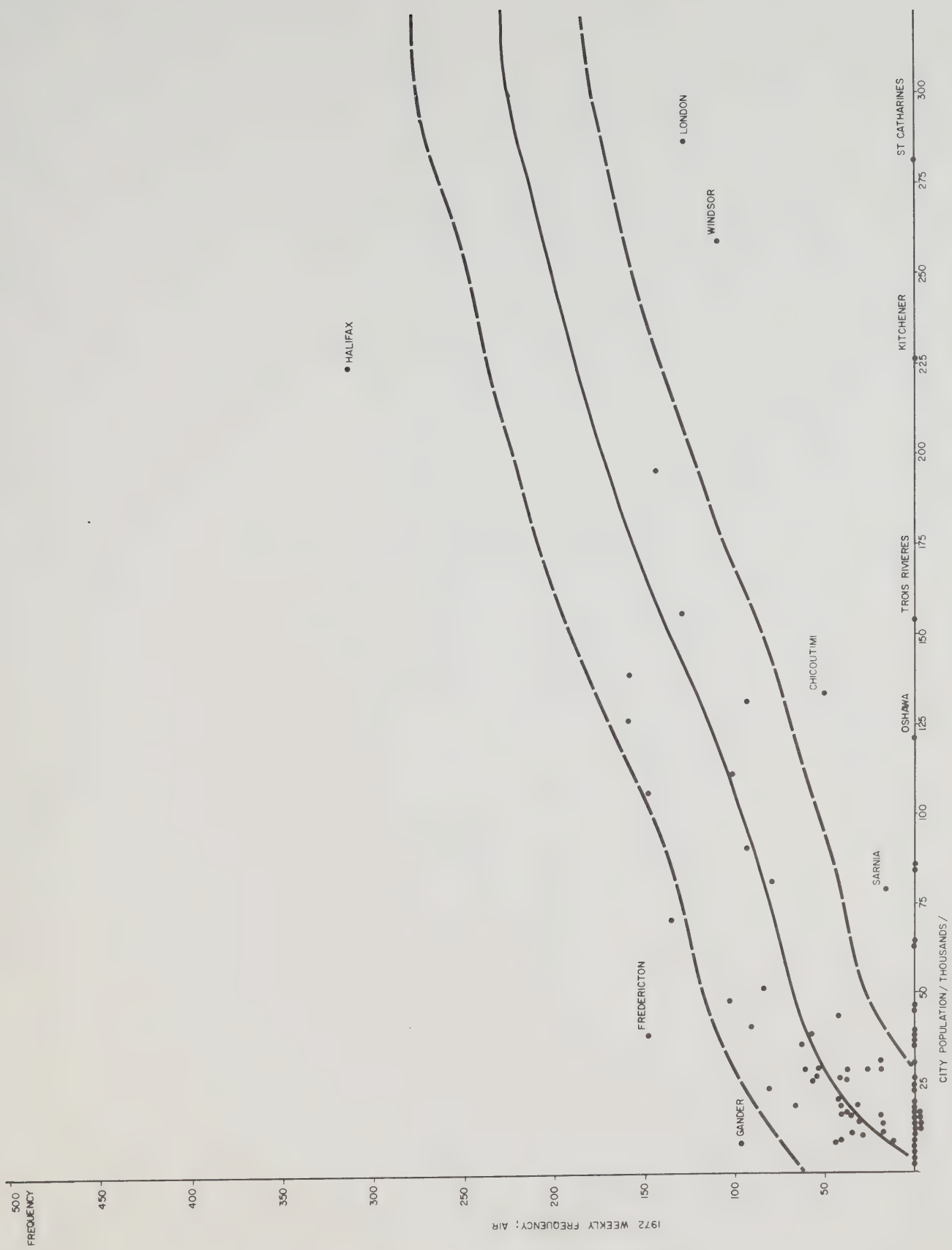
NUMBER OF DIFFERENT MODES  
AVAILABLE AT EACH NODE

|                         | <u>THREE</u><br><u>MODES</u> | <u>TWO</u><br><u>MODES</u> | <u>ONE</u><br><u>MODE</u> | <u>TOTAL</u> |
|-------------------------|------------------------------|----------------------------|---------------------------|--------------|
| Newfoundland            | 0                            | 3                          | 1                         | 4            |
| Nova Scotia             | 3                            | 2                          | 0                         | 5            |
| New Brunswick           | 6                            | 1                          | 0                         | 7            |
| Prince Edward<br>Island | 0                            | 1                          | 0                         | 1            |
| Quebec                  | 6                            | 8                          | 2                         | 16           |
| Ontario                 | 14                           | 12                         | 0                         | 26           |
| Manitoba                | 4                            | 1                          | 0                         | 5            |
| Saskatchewan            | 3                            | 5                          | 0                         | 8*           |
| Alberta                 | 5                            | 4                          | 0                         | 9*           |
| British Columbia        | <u>8</u>                     | <u>6</u>                   | <u>0</u>                  | <u>14</u>    |
| TOTAL                   | 49                           | 42                         | 3                         | 94           |

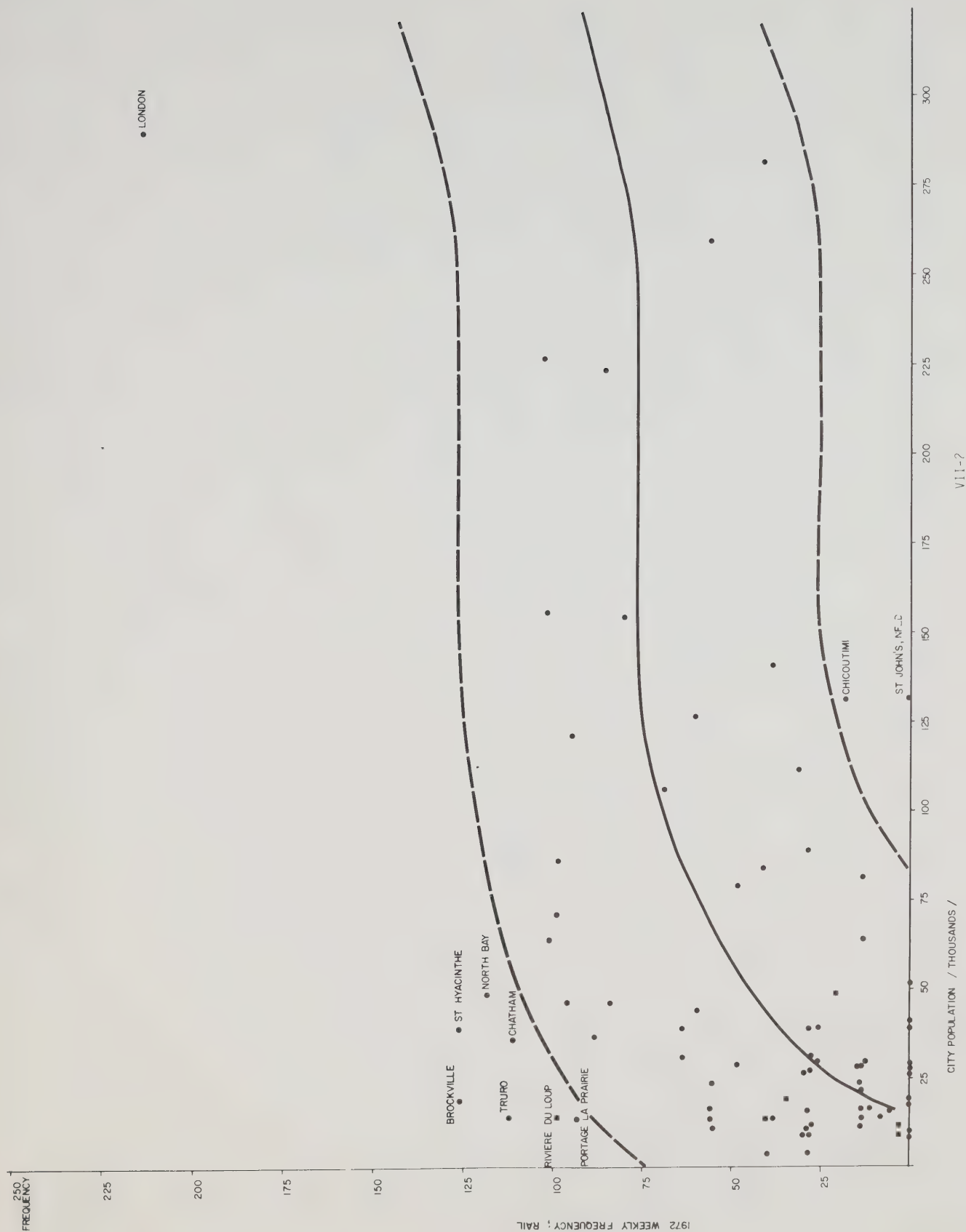
\* Lloydminster included in both Alberta and Saskatchewan.



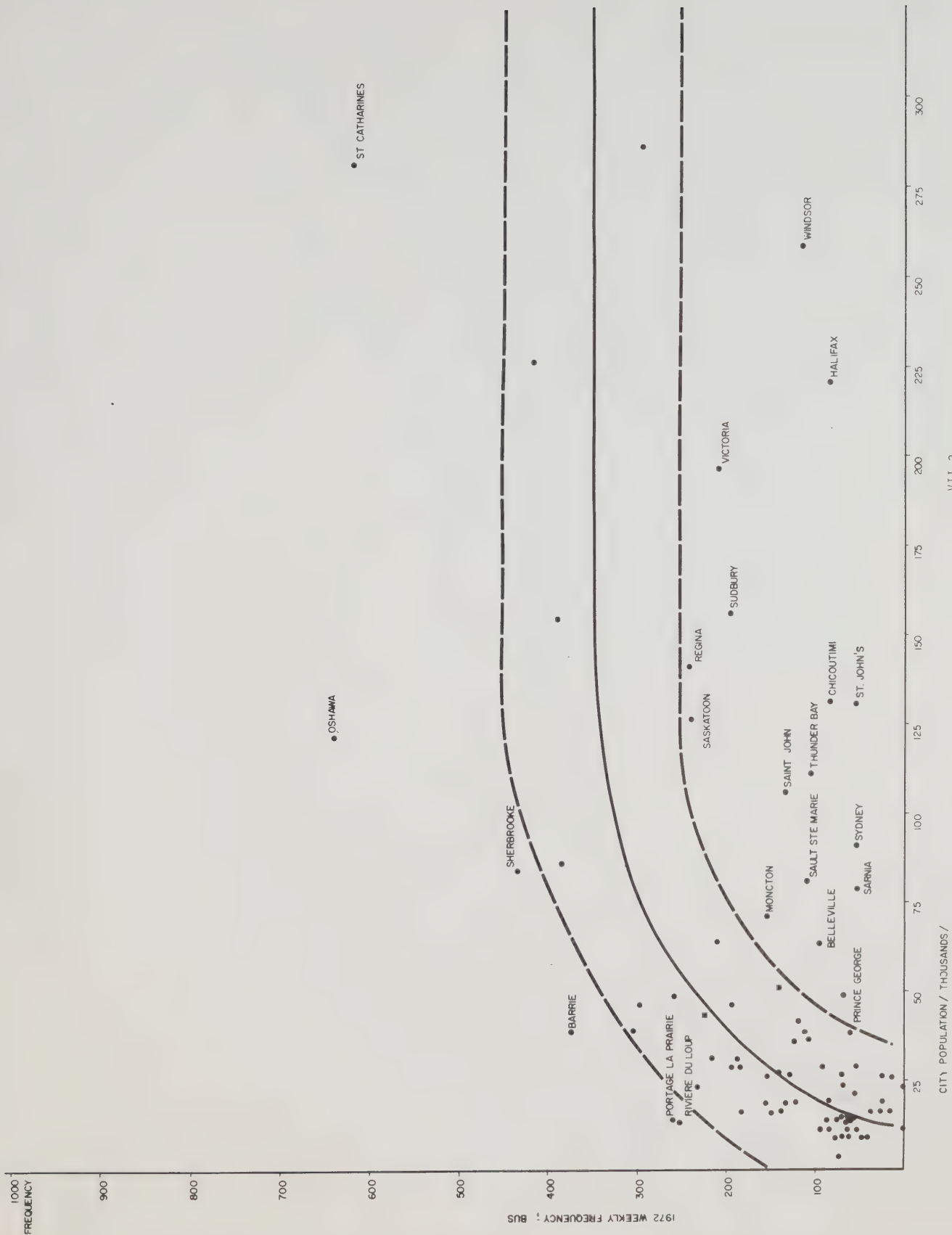
AIR FREQUENCY AND CITY SIZE





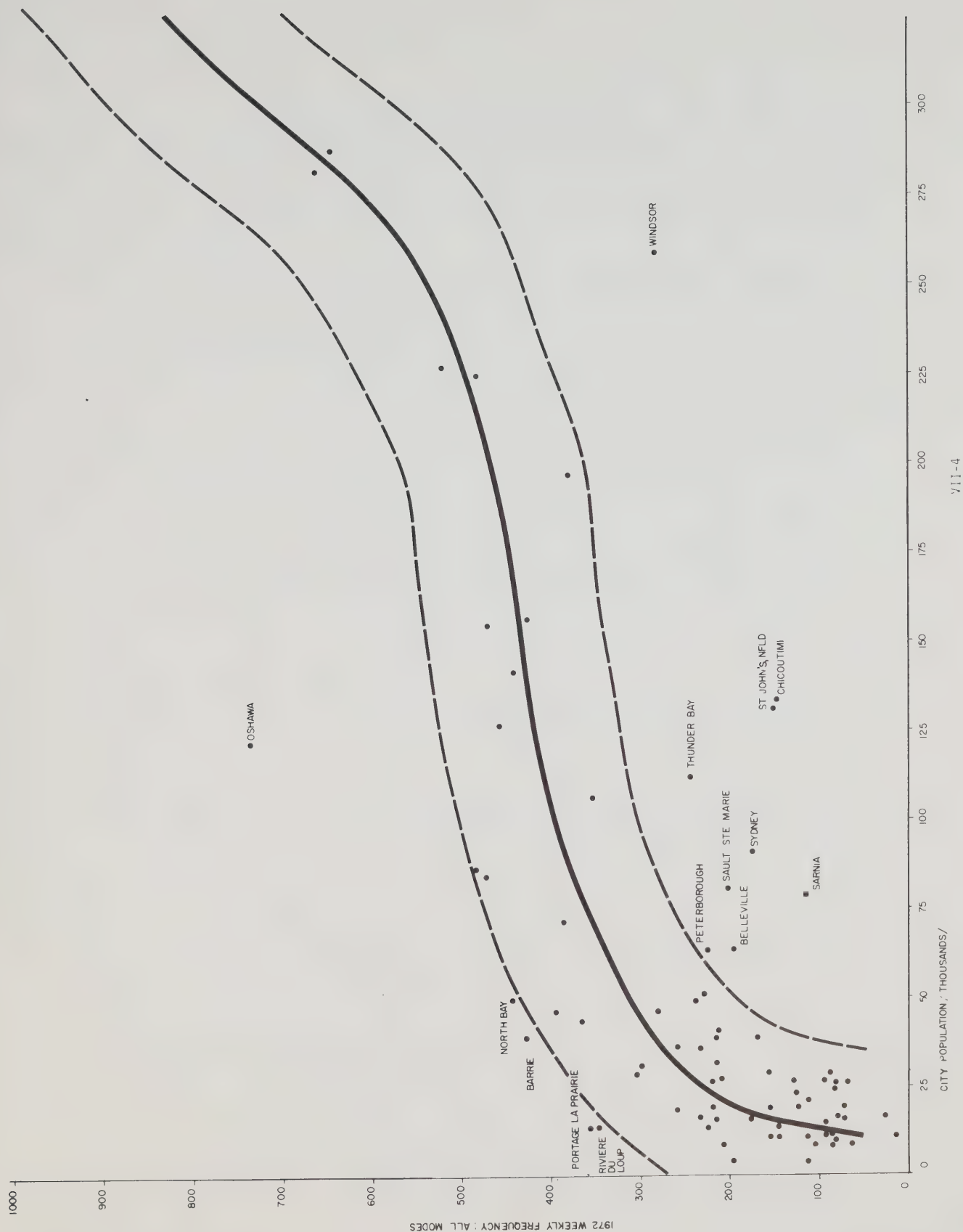








# TOTAL FREQUENCY AND CITY SIZE





Interpretation of these figures requires the caveat that service availability can only be realistically evaluated in conjunction with demand and this will be examined in subsequent reports. Examples of apparent underservice in 1972 include:

- Sarnia and Windsor, located at the end of a corridor on the U.S. border, particularly poorly served by air.
- Chicoutimi which appears to be poorly served by the ground modes.
- Belleville-Trenton which has only east-west bus and rail services.
- Peterborough with no air service and rail only to Toronto.
- Sault Ste. Marie, Thunder Bay, Sudbury and Prince George because of their geographic location far from other major centres.
- St. John's, Sydney and Victoria located at extremities of the national transportation system.
- Moncton, Saint John and Halifax, major centres with relatively infrequent bus services.

Another measure of service availability is the number of nodes that can be reached directly, without transfer, from each node. This is shown in Table VII-3. Observations made from this table of 1972 measures include:

- the low number of nodes reached directly from Maritime centres because of the lack of through bus services.
- Victoria has air flights only to Vancouver.
- several Prairie communities have few connections by air.
- Sarnia and Pembroke also have few air connections.
- Charlottetown has no direct bus connections to other nodes on the network.

TABLE VII-3

Number of Nodes that Can be Reached  
Without Transfer from Each Node, by Node

|                              | AIR | BUS | TRAIN |
|------------------------------|-----|-----|-------|
| St. John's                   | 6   | 3   | 0     |
| Grand Falls/Windsor          | 0   | 3   | 0     |
| Corner Brook                 | 6   | 3   | 0     |
| Sydney                       | 8   | 3   | 3     |
| Truro                        | 0   | 3   | 13    |
| Halifax/Dartmouth            | 15  | 4   | 15    |
| Charlottetown                | 9   | 0   | 0     |
| Moncton                      | 9   | 6   | 13    |
| Saint John                   | 7   | 3   | 6     |
| Fredericton                  | 12  | 4   | 3     |
| Chatham/Newcastle            | 5   | 5   | 11    |
| Bathurst                     | 7   | 4   | 11    |
| Darmouth                     | 3   | 1   | 2     |
| New Glasgow/Stellarton       | 0   | 3   | 3     |
| Gander                       | 4   | 3   | 0     |
| Campbellton                  | 7   | 8   | 11    |
| Edmunston                    | 0   | 8   | 3     |
| Montreal                     | 27  | 14  | 25    |
| St-Hyacinthe                 | 0   | 5   | 13    |
| Drummondville                | 0   | 6   | 12    |
| Sherbrooke                   | 0   | 6   | 4     |
| Thetford Mines               | 0   | 5   | 0     |
| Trois-Rivières/Shawinigan    | 0   | 5   | 2     |
| Quebec                       | 10  | 14  | 16    |
| La Tuque                     | 0   | 3   | 1     |
| Chicoutimi/Jonquière         | 4   | 1   | 1     |
| Val-D'Or                     | 5   | 2   | 0     |
| Rivière-du-Loup              | 0   | 5   | 12    |
| Rimouski                     | 4   | 4   | 12    |
| Baie-Comeau                  | 5   | 1   | 0     |
| Sept-Iles                    | 8   | 0   | 0     |
| Gaspé                        | 0   | 4   | 6     |
| Rouyn/Noranda                | 6   | 4   | 2     |
| Cornwall                     | 0   | 5   | 6     |
| Ottawa-Hull                  | 13  | 8   | 14    |
| Brockville                   | 0   | 6   | 7     |
| Kingston                     | 0   | 7   | 6     |
| Belleville/Trenton           | 0   | 4   | 6     |
| Peterborough                 | 0   | 3   | 1     |
| Oshawa/Whitby                | 0   | 5   | 5     |
| Toronto/Mississauga          | 23  | 19  | 19    |
| Hamilton                     | 4   | 8   | 6     |
| St. Catherines/Niagara Falls | 0   | 4   | 2     |
| Kitchener/Waterloo           | 0   | 5   | 3     |

TABLE VII-3 (cont'd)

|                        | AIR | BUS | TRAIN |
|------------------------|-----|-----|-------|
| London                 | 5   | 6   | 6     |
| Sarnia                 | 2   | 2   | 2     |
| Chatham                | 0   | 5   | 4     |
| Windsor                | 7   | 4   | 4     |
| Barrie                 | 0   | 4   | 4     |
| Pembroke               | 1   | 4   | 13    |
| North Bay              | 2   | 20  | 19    |
| Sudbury                | 5   | 17  | 16    |
| Sault Ste. Marie       | 7   | 14  | 1     |
| Fort Erie/Welland      | 0   | 4   | 2     |
| Kirkland Lake          | 3   | 4   | 2     |
| Timmins                | 3   | 6   | 1     |
| Kapuskasing            | 0   | 3   | 4     |
| Thunder Bay            | 4   | 14  | 15    |
| Winnipeg/Selkirk       | 18  | 23  | 22    |
| Portage La Prairie     | 0   | 8   | 25    |
| Brandon                | 1   | 15  | 23    |
| Thompson               | 1   | 2   | 2     |
| Kenora                 | 4   | 14  | 15    |
| Saskatoon              | 10  | 12  | 17    |
| Regina                 | 11  | 10  | 15    |
| Yorkton/Melville       | 0   | 8   | 15    |
| Moose Jaw              | 0   | 9   | 14    |
| Swift Current          | 0   | 8   | 14    |
| Prince Albert          | 0   | 1   | 1     |
| North Battleford       | 0   | 9   | 2     |
| Flin Flon              | 2   | 2   | 1     |
| Lloydminster           | 0   | 9   | 1     |
| Victoria               | 1   | 2   | 15    |
| Vancouver              | 17  | 19  | 18    |
| Nanaimo                | 0   | 2   | 15    |
| Prince Rupert          | 3   | 2   | 3     |
| Terrace/Kitimat        | 4   | 2   | 3     |
| Prince George          | 7   | 5   | 4     |
| Dawson Creek           | 2   | 4   | 2     |
| Kamloops               | 8   | 14  | 16    |
| Kelowna/Vernon         | 6   | 3   | 0     |
| Penticton              | 6   | 5   | 0     |
| Cranbrook              | 6   | 5   | 0     |
| Jasper                 | 0   | 10  | 18    |
| Banff                  | 0   | 10  | 14    |
| Grande Prairie         | 2   | 3   | 2     |
| Edmonton               | 13  | 14  | 20    |
| Red Deer               | 4   | 2   | 2     |
| Calgary                | 13  | 14  | 16    |
| Lethbridge             | 4   | 2   | 0     |
| Medicine Hat           | 2   | 9   | 14    |
| Nelson/Trail Castlegar | 4   | 5   | 0     |
| Fort St. John          | 4   | 3   | 0     |
| White Rock             | 0   | 0   | 1     |

TABLE VII-3 (cont'd)

|                       | AIR  | BUS  | TRAIN |
|-----------------------|------|------|-------|
| <u>Average Values</u> |      |      |       |
| National Network      | 10.7 | 11.1 | 14.0  |
| Maritimes Region      | 7.5  | 3.8  | 7.8   |
| North Central Region  | 8.4  | 5.6  | 8.4   |
| Central Region        | 6.1  | 7.2  | 6.7   |
| Prairie Region        | 6.4  | 9.6  | 12.1  |
| Pacific Region        | 5.9  | 6.8  | 9.0   |

ACCESSIBILITY

Any accessibility measures that depend directly or indirectly on distance will show geographically remote communities in an unfavourable light. In other words, accessibility measures both location and transport service. Figures VII-5 through VII-8 show the distribution of access times to the nearest city of 200,000 population by region by mode. As would be expected, the Central Region, basically Ontario, has the most even distribution of access times for the surface modes. Air reduces the disadvantage of remote location.

To examine the accessibility of individual nodes, the fare in cents per mile, the on-board speed in miles per hour (excluding wait and transfer time), and the weekly frequency from each node to its provincial capital, were calculated and are shown in Table VII-4. Observations that can be made include the relatively low bus speeds in the Maritimes, and the extremely low rail fares in Quebec and New Brunswick.

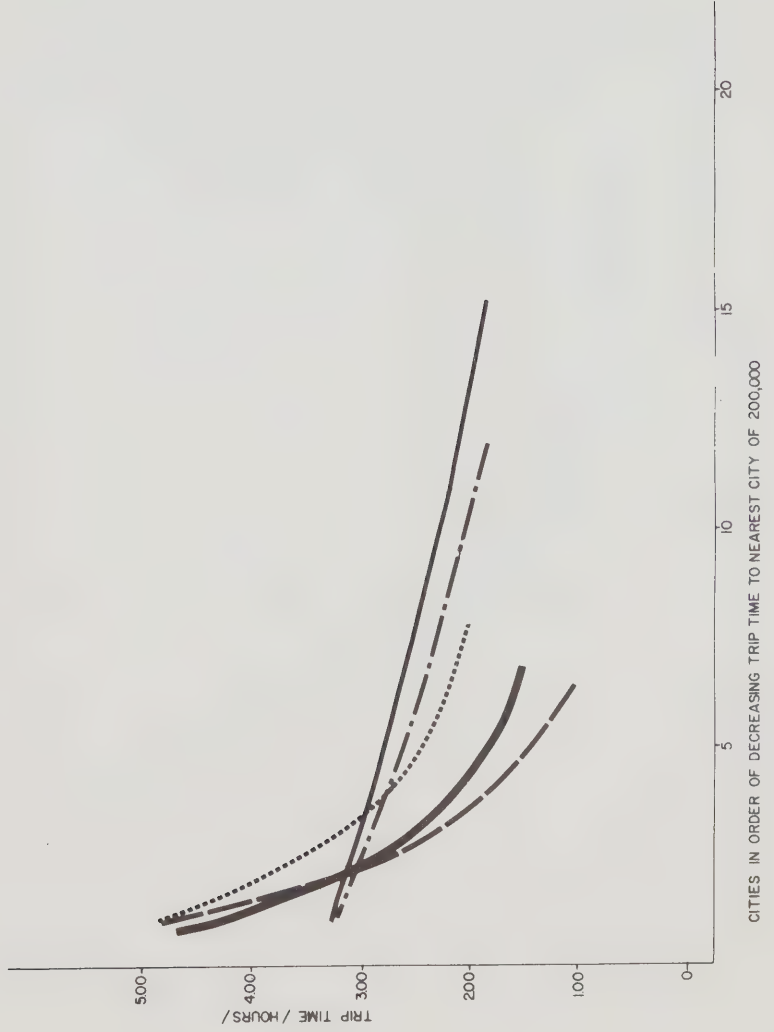
Work is continuing on the measurement of accessibility.

# AIR ACCESS TIME TO CITY OF 200,000 POPULATION

REGIONS

MARITIME  
 NORTH CENTRAL  
 CENTRAL  
 PRAIRIE  
 PACIFIC

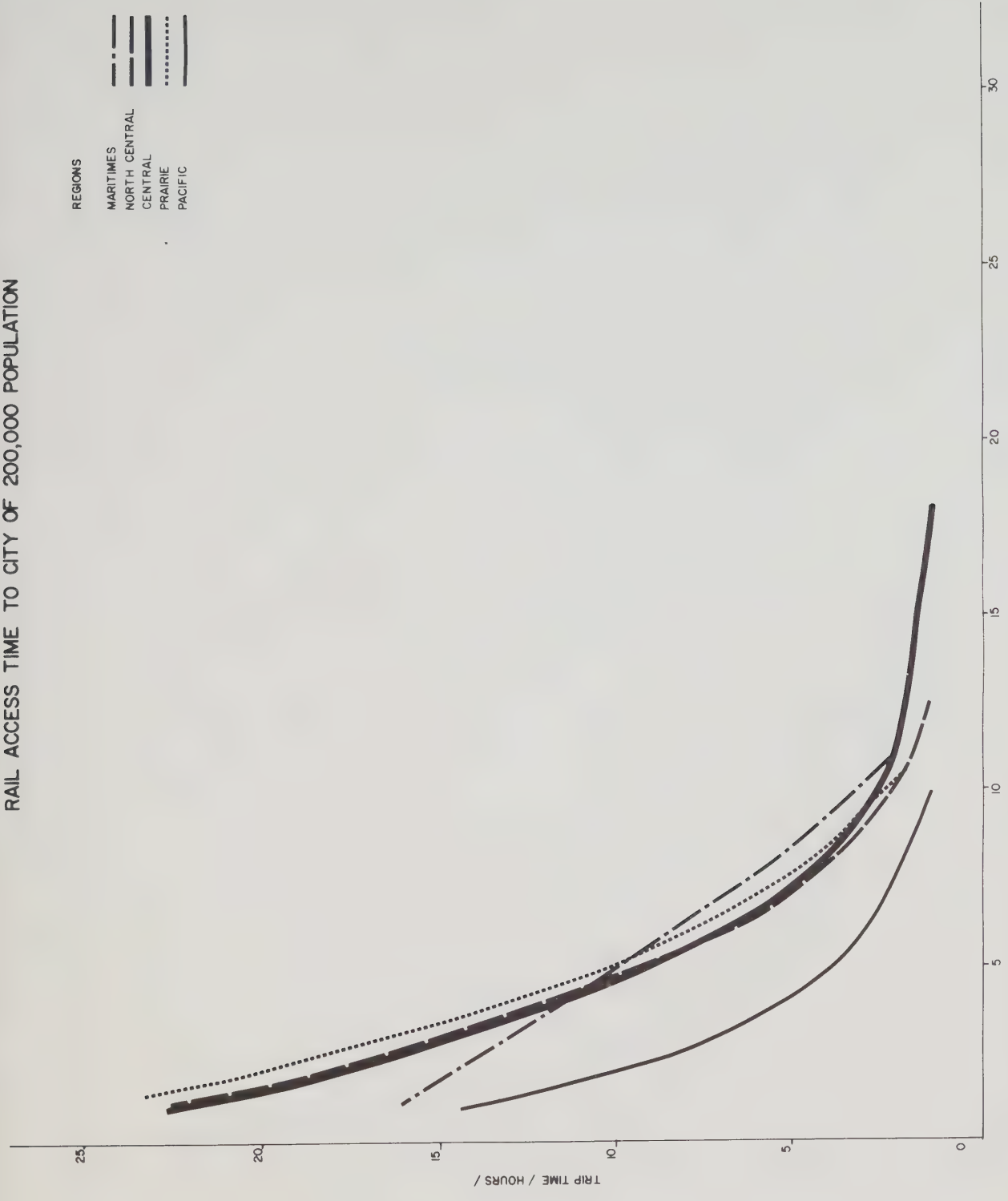
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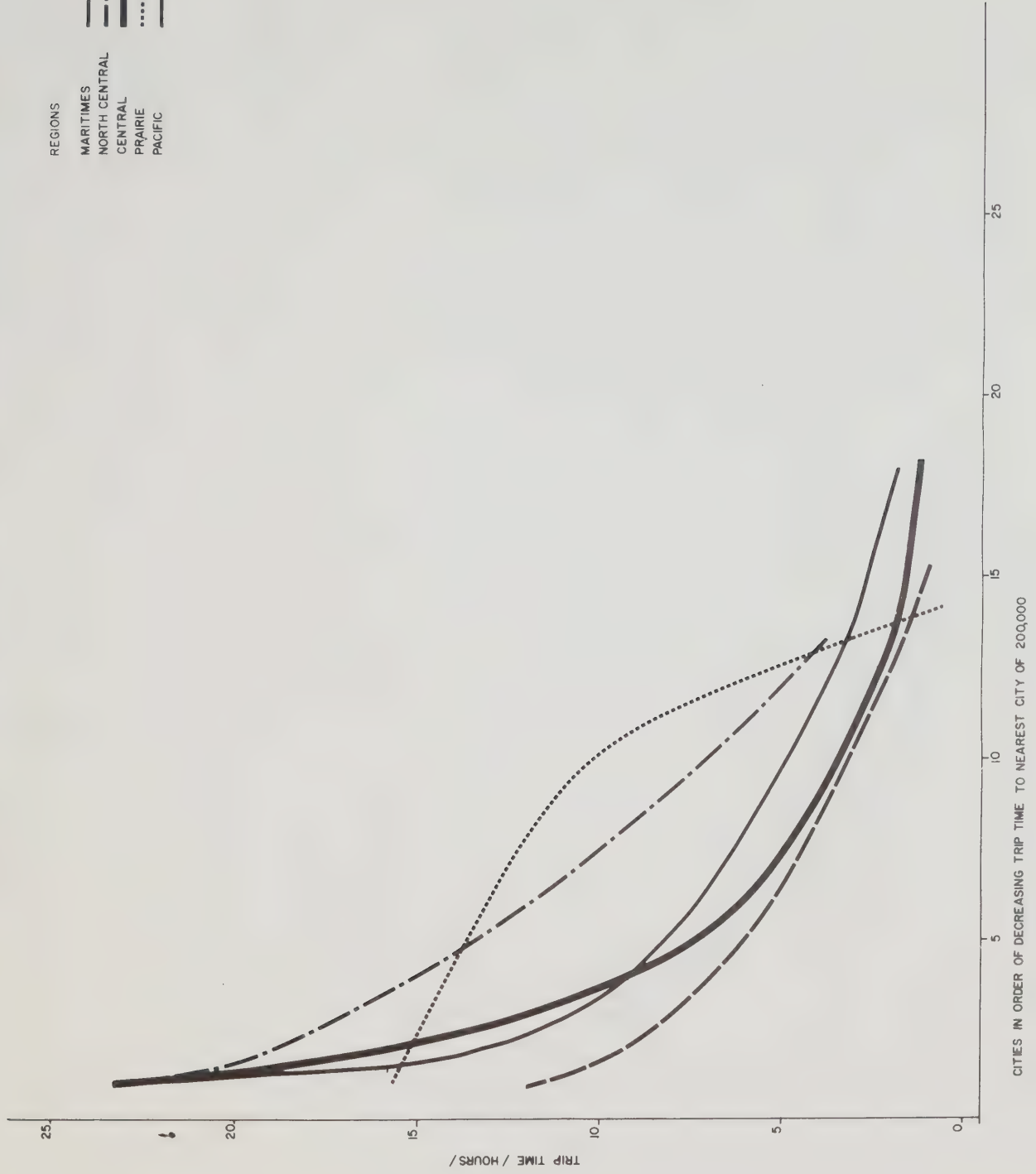
# RAIL ACCESS TIME TO CITY OF 200,000 POPULATION

- REGIONS
- MARITIMES
  - NORTH CENTRAL
  - CENTRAL
  - PRAIRIE
  - PACIFIC





# BUS ACCESS TIME TO CITY OF 200,000 POPULATION





# CAR ACCESS TIME TO CITY OF 200,000 POPULATION

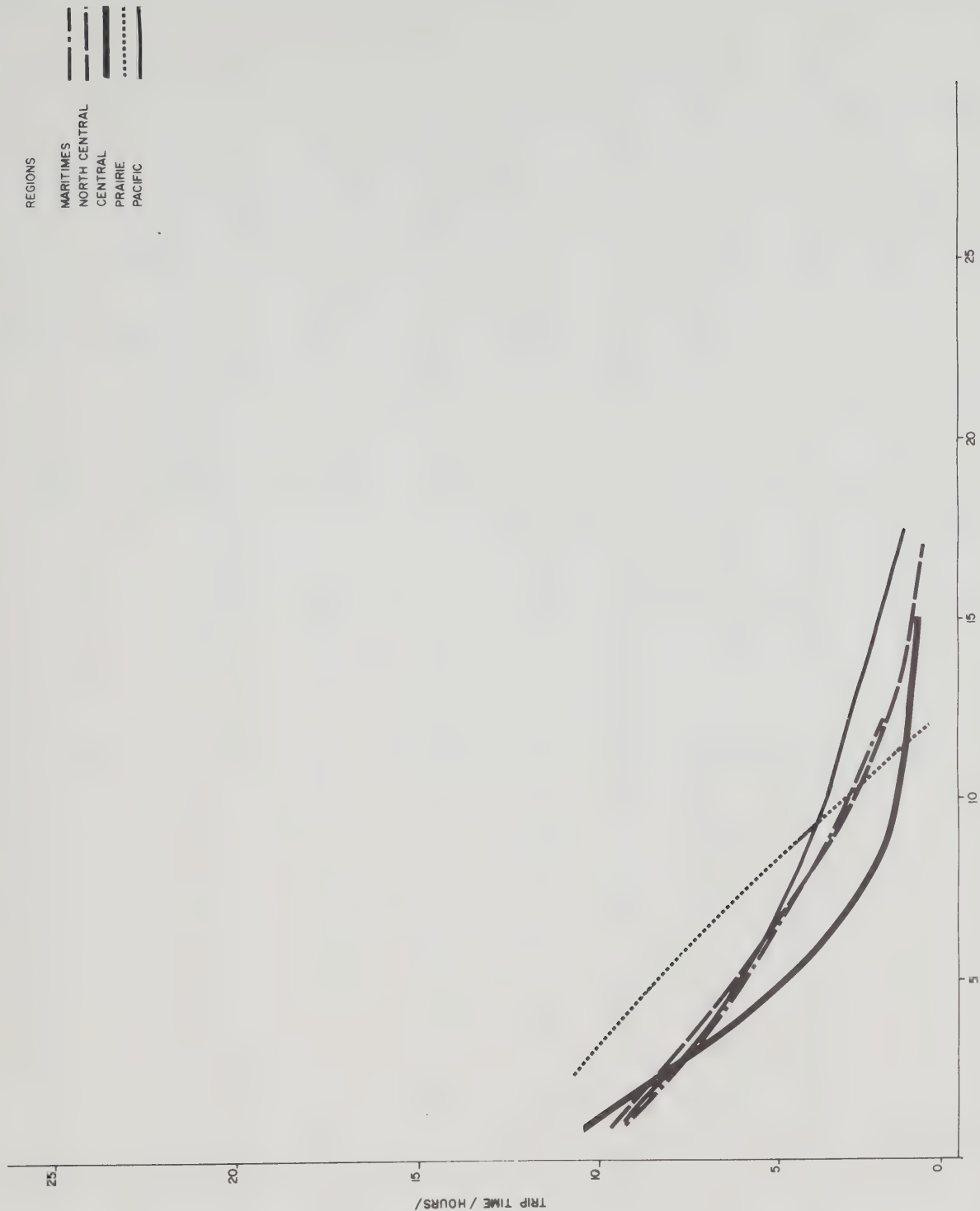




TABLE VII-4

1972 NODAL TRANSPORT ACCESSIBILITY TO PROVINCIAL CAPITAL

| NODE         | PROVINCIAL<br>NODE | /----- RATE (CENTS/MILE) |      |      |      | /----- ON BOARD SPEED (M.P.H.) |      |      |      |
|--------------|--------------------|--------------------------|------|------|------|--------------------------------|------|------|------|
|              |                    | AIR                      | RAIL | BUS  | AUTO | AIR                            | RAIL | BUS  | AUTO |
| 1. ST. JOHN  | 1. ST. JOHN        | 0.0                      | 0.0  | 0.0  | 0.0  | 0.0                            | 0.0  | 0.0  | 0.0  |
| 2. GR FALLS  | 1. ST. JOHN        | -0.1                     | -0.1 | 3.2  | 3.7  | -1.0                           | -1.0 | 35.0 | 54.0 |
| 3. CORNER B  | 1. ST. JOHN        | 11.8                     | -0.1 | 2.7  | 3.7  | 134.0                          | -1.0 | 39.0 | 55.0 |
| 4. SYDNEY    | 6. HALIFAX/        | 12.1                     | 3.9  | 4.9  | 3.7  | 237.0                          | 30.0 | 30.0 | 55.0 |
| 5. TRURO     | 6. HALIFAX/        | -0.1                     | 5.2  | 6.5  | 3.7  | -1.0                           | 46.0 | 35.0 | 54.0 |
| 6. HALIFAX/  | 6. HALIFAX/        | 0.0                      | 0.0  | 0.0  | 0.0  | 0.0                            | 0.0  | 0.0  | 0.0  |
| 7. CHARLOTT  | 7. CHARLOTT        | 0.0                      | 0.0  | 0.0  | 0.0  | 0.0                            | 0.0  | 0.0  | 0.0  |
| 8. MONCTON   | 10. FREDRICK       | 14.6                     | 3.9  | 5.1  | 3.8  | 108.0                          | 41.0 | 38.0 | 61.0 |
| 9. SAINT JO  | 10. FREDRICK       | 26.5                     | 15.5 | 4.6  | 3.7  | 123.0                          | 34.0 | 30.0 | 51.0 |
| 10. FREDRICK | 10. FREDRICK       | 0.0                      | 0.0  | 0.0  | 0.0  | 0.0                            | 0.0  | 0.0  | 0.0  |
| 11. CHATHAM/ | 10. FREDRICK       | 10.6                     | 2.2  | 4.4  | 3.7  | 134.0                          | 42.0 | 31.0 | 45.0 |
| 12. BATHURST | 10. FREDRICK       | -0.1                     | 2.5  | 4.2  | 3.7  | 82.0                           | 42.0 | 33.0 | 45.0 |
| 13. YARMOUTH | 6. HALIFAX/        | 8.9                      | 4.5  | 5.1  | 3.7  | 140.0                          | 43.0 | 32.0 | 51.0 |
| 14. N GLASGO | 6. HALIFAX/        | -0.1                     | 4.5  | 5.8  | 3.7  | -1.0                           | 23.0 | 29.0 | 54.0 |
| 15. GANDER   | 1. ST. JOHN        | 11.2                     | -0.1 | 3.5  | 3.8  | 250.0                          | -1.0 | 39.0 | 54.0 |
| 16. CAMPBELL | 10. FREDRICK       | 11.6                     | 2.7  | 3.9  | 3.7  | 82.0                           | 43.0 | 32.0 | 50.0 |
| 17. EDMUNDST | 10. FREDRICK       | -0.1                     | 1.9  | 4.2  | 3.7  | -1.0                           | 44.0 | 31.0 | 56.0 |
| 18. MONTREAL | 24. QUEBEC         | 12.9                     | 5.0  | 4.4  | 3.7  | 184.0                          | 47.0 | 43.0 | 59.0 |
| 19. ST. HYAC | 24. QUEBEC         | -0.1                     | 3.2  | 3.6  | 3.7  | -1.0                           | 70.0 | 41.0 | 60.0 |
| 20. DRUMMOND | 24. QUEBEC         | -0.1                     | 3.0  | 4.3  | 3.7  | -1.0                           | 73.0 | 34.0 | 59.0 |
| 21. SHERBROO | 24. QUEBEC         | -0.1                     | 0.6  | 3.9  | 3.7  | -1.0                           | 37.0 | 42.0 | 60.0 |
| 22. THETFORD | 24. QUEBEC         | -0.1                     | -0.1 | 5.0  | 3.7  | -1.0                           | -1.0 | 18.0 | 54.0 |
| 23. TROIS RI | 24. QUEBEC         | -0.1                     | 5.9  | 4.5  | 3.7  | -1.0                           | 54.0 | 35.0 | 46.0 |
| 24. QUEBEC   | 24. QUEBEC         | 0.0                      | 0.0  | 0.0  | 0.0  | 0.0                            | 0.0  | 0.0  | 0.0  |
| 25. LA TUQUE | 24. QUEBEC         | -0.1                     | 4.5  | 4.2  | 3.7  | -1.0                           | 27.0 | 44.0 | 46.0 |
| 26. CHICOUTI | 24. QUEBEC         | 15.7                     | 4.1  | 4.1  | 3.8  | 135.0                          | 30.0 | 54.0 | 55.0 |
| 27. VAL D'OR | 24. QUEBEC         | 11.2                     | 1.8  | 4.2  | 3.7  | 205.0                          | 34.0 | 49.0 | 47.0 |
| 28. RIVIERE  | 24. QUEBEC         | -0.1                     | 4.6  | 4.1  | 3.7  | -1.0                           | 48.0 | 41.0 | 60.0 |
| 29. RIMOUSKI | 24. QUEBEC         | 13.0                     | 4.7  | 4.1  | 3.7  | 107.0                          | 37.0 | 39.0 | 59.0 |
| 30. B COMEAU | 24. QUEBEC         | 12.3                     | -0.1 | -0.1 | 3.7  | 274.0                          | -1.0 | 38.0 | 45.0 |
| 31. SEPT ILE | 24. QUEBEC         | 9.3                      | -0.1 | -0.1 | 3.7  | 222.0                          | -1.0 | -1.0 | 45.0 |
| 32. GASPE    | 24. QUEBEC         | -0.1                     | 3.3  | 3.4  | 3.7  | -1.0                           | 34.0 | 46.0 | 47.0 |
| 33. ROUYN/NO | 24. QUEBEC         | 8.6                      | 2.1  | 4.2  | 5.4  | 174.0                          | 33.0 | 46.0 | 46.0 |
| 34. CORNWALL | 41. TORONTO/       | -0.1                     | 5.0  | 2.9  | 3.7  | -1.0                           | 44.0 | 55.0 | 59.0 |
| 35. OTTAWA/H | 41. TORONTO/       | 11.1                     | 3.6  | 4.9  | 3.7  | 282.0                          | 49.0 | 54.0 | 55.0 |
| 36. BROCKVIL | 41. TORONTO/       | -0.1                     | 4.3  | 3.4  | 3.7  | -1.0                           | 52.0 | 53.0 | 59.0 |
| 37. KINGSTON | 41. TORONTO/       | -0.1                     | 4.3  | 3.6  | 3.7  | -1.0                           | 51.0 | 61.0 | 60.0 |
| 38. BELLEVIL | 41. TORONTO/       | -0.1                     | 4.4  | 3.7  | 3.7  | -1.0                           | 54.0 | 46.0 | 59.0 |
| 39. PETERBOR | 41. TORONTO/       | -0.1                     | 3.9  | 4.2  | 3.7  | -1.0                           | 36.0 | 47.0 | 56.0 |
| 40. OSHAWA/W | 41. TORONTO/       | -0.1                     | 6.1  | 4.4  | 3.7  | -1.0                           | 46.0 | 24.0 | 62.0 |
| 41. TORONTO/ | 41. TORONTO/       | 0.0                      | 0.0  | 0.0  | 0.0  | 0.0                            | 0.0  | 0.0  | 0.0  |
| 42. HAMILTON | 41. TORONTO/       | 5.6                      | 5.8  | 5.1  | 3.8  | 31.0                           | 43.0 | 31.0 | 64.0 |
| 43. ST CATHS | 41. TORONTO/       | -0.1                     | 5.7  | 3.8  | 3.8  | -1.0                           | 38.0 | 52.0 | 60.0 |
| 44. KITCHENE | 41. TORONTO/       | -0.1                     | 5.1  | 3.7  | 3.7  | -1.0                           | 37.0 | 33.0 | 57.0 |
| 45. LONDON   | 41. TORONTO/       | 15.9                     | 4.4  | 3.4  | 3.7  | 176.0                          | 42.0 | 53.0 | 57.0 |
| 46. SARNIA   | 41. TORONTO/       | 13.7                     | 4.5  | 3.4  | 3.7  | 133.0                          | 45.0 | 46.0 | 56.0 |
| 47. CHATHAM  | 41. TORONTO/       | -0.1                     | 4.5  | 3.6  | 3.7  | -1.0                           | 44.0 | 48.0 | 57.0 |
| 48. WINDSOR  | 41. TORONTO/       | 11.8                     | 4.0  | 3.3  | 3.7  | 244.0                          | 46.0 | 52.0 | 58.0 |
| 49. BARRIE   | 41. TORONTO/       | -0.1                     | 5.2  | 4.3  | 3.7  | -1.0                           | 37.0 | 37.0 | 62.0 |

TABLE VII-4 (Cont'd)

1972 NODAL TRANSPORT ACCESSIBILITY TO PROVINCIAL CAPITAL

| NODE          | PROVINCIAL<br>NODE | RATE (CENTS/MILE) / |      |      |      | ON BOARD SPEED (M.P.H.) / |      |      |      |
|---------------|--------------------|---------------------|------|------|------|---------------------------|------|------|------|
|               |                    | AIR                 | RAIL | BUS  | AUTO | AIR                       | RAIL | BUS  | AUTO |
| 50. PEMBROKE  | 41. TORONTO/       | 14.7                | 3.6  | 4.3  | 3.7  | 136.0                     | 47.0 | 43.0 | 54.0 |
| 51. NORTH BA  | 41. TORONTO/       | 12.4                | 4.5  | 3.6  | 3.7  | 207.0                     | 39.0 | 37.0 | 57.0 |
| 52. SUDBURY   | 41. TORONTO/       | 11.4                | 3.8  | 4.2  | 3.7  | 151.0                     | 43.0 | 45.0 | 57.0 |
| 53. SAULT ST  | 41. TORONTO/       | 9.8                 | 4.3  | 3.7  | 3.7  | 306.0                     | 45.0 | 46.0 | 56.0 |
| 54. F ERIE/W  | 41. TORONTO/       | -0.1                | 4.4  | 4.4  | 3.7  | -1.0                      | 58.0 | 49.0 | 59.0 |
| 55. KIRKLAND  | 41. TORONTO/       | 10.0                | 5.2  | 3.9  | 3.7  | 156.0                     | 23.0 | 40.0 | 57.0 |
| 56. TIMMINS   | 41. TORONTO/       | 9.2                 | 4.2  | 4.3  | 3.8  | 217.0                     | 27.0 | 53.0 | 56.0 |
| 57. KAPUSKAS  | 41. TORONTO/       | -0.1                | 4.0  | 4.3  | 3.7  | -1.0                      | 32.0 | 39.0 | 56.0 |
| 58. THUNDER   | 41. TORONTO/       | 8.0                 | 4.6  | 3.7  | 4.7  | 404.0                     | 40.0 | 42.0 | 55.0 |
| 59. WINNIPEG  | 59. WINNIPEG       | 0.0                 | 0.0  | 0.0  | 0.0  | 0.0                       | 0.0  | 0.0  | 0.0  |
| 60. PORTAGE   | 59. WINNIPEG       | -0.1                | 5.5  | 4.0  | 3.8  | -1.0                      | 46.0 | 48.0 | 58.0 |
| 61. BRANDON   | 59. WINNIPEG       | 11.7                | 4.4  | 3.5  | 3.7  | 133.0                     | 50.0 | 52.0 | 55.0 |
| 62. THOMPSON  | 59. WINNIPEG       | 10.6                | 2.9  | 5.3  | 5.6  | 204.0                     | 20.0 | 33.0 | 39.0 |
| 63. KENORA    | 41. TORONTO/       | 6.0                 | 3.2  | 3.6  | 5.2  | 285.0                     | 39.0 | 41.0 | 55.0 |
| 64. SASKATON  | 65. REGINA         | 13.5                | 4.4  | 3.9  | 3.7  | 135.0                     | 55.0 | 49.0 | 55.0 |
| 65. REGINA    | 65. REGINA         | 0.0                 | 0.0  | 0.0  | 0.0  | 0.0                       | 0.0  | 0.0  | 0.0  |
| 66. YORKTON/  | 65. REGINA         | -0.1                | -0.1 | 4.2  | 3.7  | -1.0                      | -1.0 | 51.0 | 60.0 |
| 67. MOOSE JA  | 65. REGINA         | -0.1                | 4.8  | 4.5  | 3.8  | -1.0                      | 60.0 | 49.0 | 63.0 |
| 68. SWIFT CU  | 65. REGINA         | -0.1                | 4.6  | 3.5  | 3.8  | -1.0                      | 52.0 | 49.0 | 56.0 |
| 69. PRINCE A  | 65. REGINA         | 11.3                | 3.8  | 4.2  | 3.7  | 128.0                     | 51.0 | 43.0 | 55.0 |
| 70. NORTH BA  | 65. REGINA         | -0.1                | -0.1 | 4.2  | 3.7  | -1.0                      | -1.0 | 50.0 | 54.0 |
| 71. FLIN FLD  | 59. WINNIPEG       | 14.1                | -0.1 | 3.9  | 5.3  | 171.0                     | 12.0 | 43.0 | 54.0 |
| 72. LLOYDMIN  | 87. EDMONTON       | -0.1                | 4.4  | 3.5  | 3.8  | -1.0                      | 52.0 | 48.0 | 49.0 |
| 73. VICTORIA  | 73. VICTORIA       | 0.0                 | 0.0  | 0.0  | 0.0  | 0.0                       | 0.0  | 0.0  | 0.0  |
| 74. VANCOUVE  | 73. VICTORIA       | 33.3                | 3.2  | 6.7  | 9.5  | 98.0                      | 27.0 | 27.0 | 17.0 |
| 75. NANAIMO   | 73. VICTORIA       | -0.1                | 6.1  | -0.1 | 3.7  | -1.0                      | 33.0 | 33.0 | 56.0 |
| 76. PRINCE R  | 73. VICTORIA       | 11.0                | 3.5  | 4.0  | 5.8  | 299.0                     | 34.0 | 39.0 | 47.0 |
| 77. TERRACE/  | 73. VICTORIA       | 11.9                | 3.6  | 4.0  | 5.1  | 277.0                     | 34.0 | 41.0 | 48.0 |
| 78. PRINCE G  | 73. VICTORIA       | 14.2                | 4.6  | 3.5  | 5.9  | 261.0                     | 32.0 | 39.0 | 44.0 |
| 79. DAWSON C  | 73. VICTORIA       | 9.3                 | -0.1 | 3.8  | 5.2  | 300.0                     | -1.0 | 40.0 | 47.0 |
| 80. KAMLOOPS  | 73. VICTORIA       | 17.4                | 3.8  | 3.5  | 4.8  | 168.0                     | 29.0 | 38.0 | 38.0 |
| 81. KELLOWNA/ | 73. VICTORIA       | 12.0                | -0.1 | 3.8  | 4.8  | 217.0                     | -1.0 | 34.0 | 39.0 |
| 82. PENTICTO  | 73. VICTORIA       | 17.4                | -0.1 | 3.7  | 4.9  | 201.0                     | -1.0 | 34.0 | 38.0 |
| 83. CRANBROD  | 73. VICTORIA       | 10.5                | -0.1 | 3.3  | 5.8  | 212.0                     | -1.0 | 31.0 | 44.0 |
| 84. JASPER(N  | 87. EDMONTON       | -0.1                | 4.0  | 3.3  | 3.7  | -1.0                      | 47.0 | 49.0 | 56.0 |
| 85. BANF(NAT  | 87. EDMONTON       | -0.1                | 4.1  | 3.7  | 3.7  | -1.0                      | 49.0 | 52.0 | 60.0 |
| 86. GRANDE P  | 87. EDMONTON       | 9.2                 | 3.0  | 4.6  | 3.7  | 312.0                     | 35.0 | 44.0 | 56.0 |
| 87. EDMONTON  | 87. EDMONTON       | 0.0                 | 0.0  | 0.0  | 0.0  | 0.0                       | 0.0  | 0.0  | 0.0  |
| 88. RED DEER  | 87. EDMONTON       | 14.6                | 3.9  | 4.0  | 3.8  | 117.0                     | 61.0 | 40.0 | 60.0 |
| 89. CALGARY   | 87. EDMONTON       | 13.0                | 4.6  | 3.6  | 3.7  | 220.0                     | 55.0 | 55.0 | 60.0 |
| 90. LETHBRID  | 87. EDMONTON       | 11.3                | -0.1 | 3.5  | 3.7  | 110.0                     | -1.0 | 51.0 | 61.0 |
| 91. MEDICINE  | 87. EDMONTON       | 11.4                | 4.6  | 3.5  | 3.7  | 186.0                     | 54.0 | 52.0 | 58.0 |
| 92. NELSON/T  | 73. VICTORIA       | 16.2                | -0.1 | 3.8  | 6.4  | 181.0                     | -1.0 | 33.0 | 42.0 |
| 93. FORT ST.  | 73. VICTORIA       | 11.7                | -0.1 | 3.8  | 5.2  | 182.0                     | -1.0 | 40.0 | 47.0 |
| 94. WHITE RO  | 73. VICTORIA       | -0.1                | -0.1 | -0.1 | 8.0  | -1.0                      | -1.0 | -1.0 | 21.0 |

## SECTION VIII: THE IMPACT OF FUTURE TECHNOLOGY

### AIR

The forecast for likely technological change in Canadian air operations is a reflection of likely world-wide change, particularly for scheduled carriers.

#### 1. PROPULSION

Modifications to reduce noise and improve specific fuel consumption will be available for most existing and all proposed jets and turbofans. Fuel economy improvements up to 20% over 1975 powerplants are possible in the case of new equipment, but will be less for modified equipment. Synthetic hydrocarbon fuels may be introduced as direct replacements for existing fuels; the development of hydrogen as an aircraft fuel will intensify, but no application is likely before 1990.

#### 2. DERIVATIVE AIRCRAFT

Stretched versions of all wide bodied aircraft and other variations such as twin-engine 747, are being considered. These are relatively conventional changes, but could improve operating cost per seat-mile by about 20% by increasing capacity.

#### 3. IMPROVED AIRCRAFT

This refers to current designs modified to embody such new aerodynamic features as supercritical wing sections, new or fanned engines, as well as more conventional changes such as stretching. Important steps forward in technology are expected which will increase productivity but at fairly high cost, reducing somewhat the actual operating cost improvement.

#### 4. NEW AIRCRAFT

Such aircraft would incorporate more engineering advances than the improved aircraft, but the development cost for a medium-range aircraft could be around \$2 billion. Despite this initial cost, operating cost reductions of 25-35% are predicted.

#### BUS

The inter-city passenger bus is not considered likely to benefit from major technological changes in the next 15 years, and appears to be approaching a limit in size and speed. Such being the case, no really major improvement in productivity is foreseen before 1990.

#### CAR

Considerable improvements in engines, sizes and weights in private cars are expected to have a significant effect on productivity over the next 15 years. Compact cars should constitute 60% of the 1990 fleet (35% in 1975) and intermediates should increase from about 26% to 29%; the balance of 11% will be full size and specialty cars.

From a productivity point of view, the weight of the average car should come down substantially because of the trend towards compact sizes and also to the introduction of new materials.

Weight reduction will bring about a corresponding reduction in power requirements, and several power plant improvements should further improve the energy cost by close to 100%.

## ROADS

Gradual improvement in road design to cater for ever-increasing traffic volumes can be expected, but no major technological change such as "automatic car control" by means of buried control circuits is foreseen in the next few years. Improvements in road building technology should reduce road building costs, but the effect of this on bus or car productivity cannot easily be assessed.

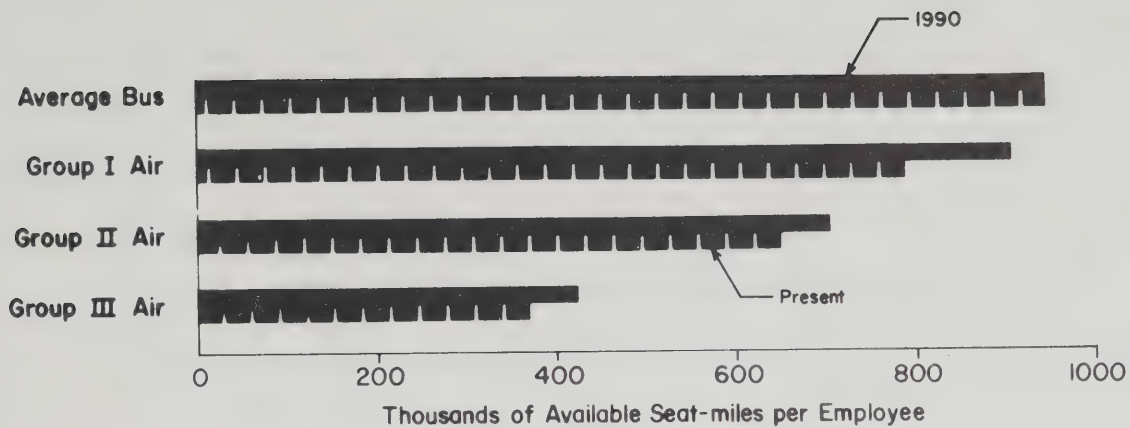
## RAIL

Because of its basically political nature it is considered unrealistic to attempt to forecast the Canadian passenger rail system 15 years hence until government decisions are taken. Probably inter-city trains will comprise the bulk of any non-suburban services. Comparisons between several locomotive/passenger car consists have been made and will be the subject of later reports.

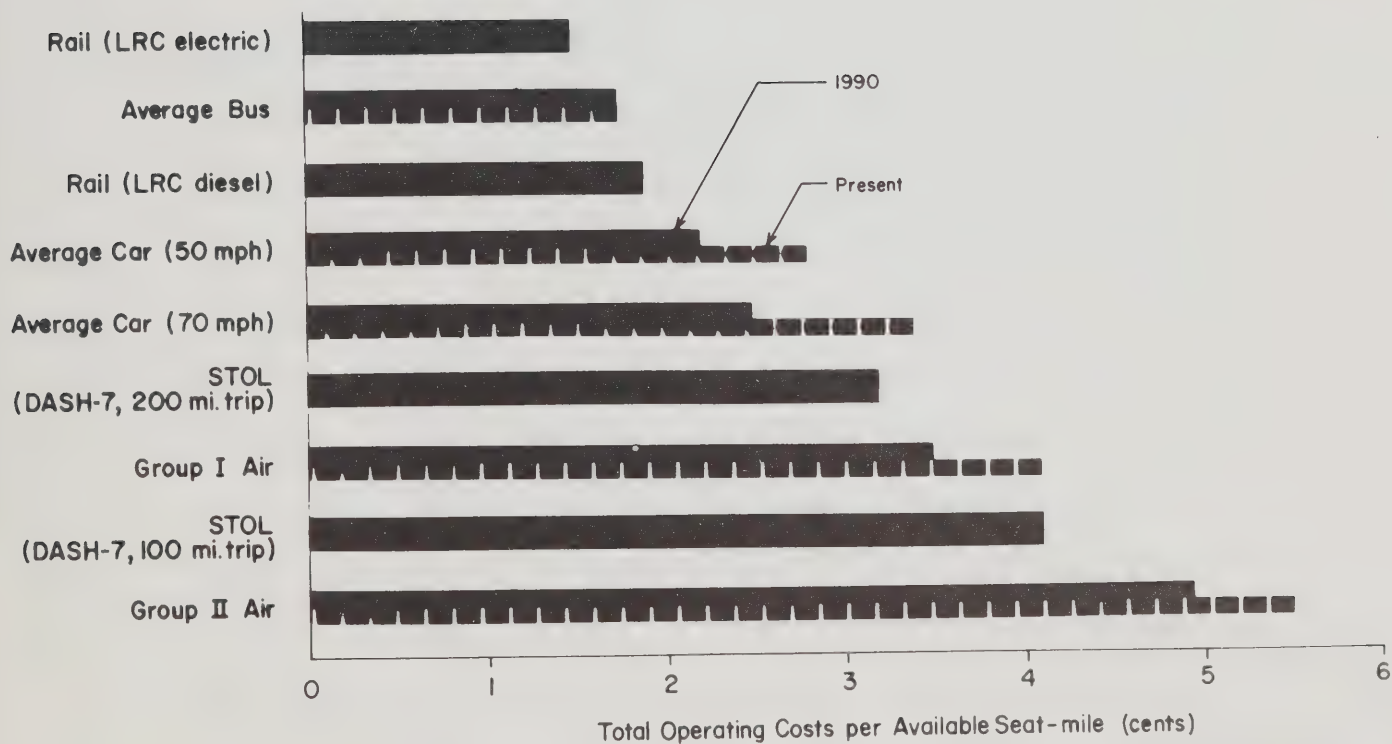
No radical technical changes are foreseen, although improvements in cost, comfort and potential speed are possible using present known technology such as the Light Rapid Comfortable (LRC) type of equipment now on test. The most important cost improvements could emerge if total freight demand should in the course of the next fifteen years justify electrification of any portion of the rail system.

Two charts on possible changes resulting from improvement in technology as shown in Figure VIII-1.





### PRODUCTIVITY OF PASSENGER MODES



### OPERATING COSTS OF PASSENGER MODES



SECTION IX: OWNERSHIP OF CARRIER OPERATIONS

A. PUBLIC AND PRIVATE OWNERSHIP

(a) AUTOS

Most automobiles are privately owned either by individuals or private companies. Government-owned autos, while numerous enough to be used as examples or leaders in new policy developments, are not significant in themselves in terms of effects. There has been a trend to use of leased vehicles, particularly by commercial companies or businessmen. This trend is expected to continue although totals affected are not as yet large.

(b) MOTOR COACHES

The motor coach industry is largely privately-owned. Statistics Canada lists 156 inter-city or rural scheduled companies, but the great majority of bus activity is carried on by about a dozen large companies, and of these, some five are directly or indirectly government-owned; in one case, Newfoundland, by C.N.; two set up as provincial crown corporations, in British Columbia and Saskatchewan; and two owned by municipal transit organizations, Gray Coach of Toronto and Canada Coach of Hamilton. In total, private ownership is the main factor in this sector although there is a public ownership component.

(c) RAIL

In ownership there is a mix of public and private ownership. Public ownership predominates in the rail passenger field, not just because the C.N.R. along with the provincially-owned railways in

Ontario and B.C. are in total larger than the C.P.R., but because of the relatively greater activity of C.N. in the passenger area.

(d) AIR

Public ownership as represented by Air Canada accounts for 67% of Canadian air carrier movement on scheduled service. The balance, a sizeable segment which has revenues in excess of the total rail and bus passenger revenues, is basically privately-owned, although the government of Alberta has recently become the largest single shareholder in the largest regional air carrier, Pacific Western Airlines. C.P. Air represents 12% and the five regionals 7%. In the international charter field, however, the regionals and supplemental carry more than twice as much as Air Canada and C.P. Air combined.

SUMMARY

In total, the companies carrying passengers on a commercial basis represent a mix of public and private ownership. Public ownership as represented by relatively few companies, accounts for the larger part of total passenger movement, but the private sector is responsible for an important part of the total -- probably about 30%, depending on the basis of calculation.

B. NATIONAL OWNERSHIP: ALL MODES

With one important exception, the common carriers are Canadian-owned. The exception is Greyhound, the largest bus company in Western Canada which also owns Eastern Greyhound and Coachways and through these three companies controls about 25% of the bus traffic. In the air mode, the regulatory

authority has required "Canadian ownership and control". There is, however, no broad legislative or regulatory legal requirement as to Canadian ownership of Canadian passenger carriers. To be generally consistent with government policy given the basic importance of transportation to the economic and social structure, there should be.

C. COMMENT

Although, in some countries, the question of private or public ownership has been approached on a philosophical basis related to imbedded party tenets, Canadian attitudes have been more pragmatic. Public ownership has been introduced where it has been necessary to achieve a particular objective incapable of achievement otherwise. In some cases, private ownership failed to meet a need. In some cases, it was not reasonable to expect them to meet the need in question. Usually, the need was of a total national (or provincial or municipal) nature which required a comprehensive single approach.

Where both private and public enterprises can function in the same area, a useful counterbalance for measuring respective efficiencies exists not just in cost performance but in service attitudes and satisfaction of public requirements. Even though political and regulatory difficulties in maintaining a balance between public and private in the face of competing pressures will be great, the results can be worthwhile. Experience in other countries seems to support this conclusion; the trend to various forms of mixed ownership in transportation activities has been quite marked in the last two or three decades.

No attempt has been made in this report to reach judgements on detailed aspects of performance of individual Canadian companies. As for the private sector versus the public sector, the broad economic indications that come from more detailed studies made in support of this report suggest that the degree of efficiency achieved (measured by various criteria) does not indicate that further nationalization, at the present time, would serve the passenger better; or that de-nationalization or a deliberate build-up of the private sector would produce better results.

Cost and productivity comparisons have high margins of error unless companies function in exactly the same environment; and when done on an international basis, have to take account of widely differing local circumstances. Nevertheless, viewed on this broad basis, the operating figures including costs of Canadian companies, bus, rail, and air are not out of line with U.S. experience -- in some cases better, in some worse, and generally better than European levels. Government and private companies are in reasonable competitive balance. C.N. and C.P. fare structures seem generally competitive. Air Canada has a better average cost than the regional carriers, but not quite as good as C.P. Air, -- a direct reflection of average passenger journey and average aircraft stage-length since the regionals have the shortest average stage-length and C.P. Air the longest. Plotted against employee-mileage ratios, Air Canada performance appears to be the best. Motor coach costs vary between companies, but reflect regional variations in cost with no pattern of publicly-owned companies basically higher or lower in efficiency.

## RECOMMENDATIONS

1. Canada should continue to rely on a combination of public and private ownership in satisfying the passenger needs of the public. To ensure the achievement of governmental objectives, the government in its current areas of active jurisdiction should, where necessary, continue to support the position of the public carriers as prime vehicles to ensure the achievement of total transportation policy and satisfactory use of transportation as an instrument to support national policies.
2. Ownership and control of major commercial transportation entities should be Canadian and, if necessary, legislative and regulatory action taken to ensure this objective.

SECTION X: COMPETITION

1. INTER-MODAL

The National Transportation Act declares that the best transportation system will result if each mode of transport is able to compete with each other mode. This philosophy was derived primarily from review of the situation with regard to the movement of freight. Applied to passenger movement, some weaknesses appear.

The passenger, including the leisure traveller as well as the business traveller, places a higher relative value on time and frequency in relation to cost than does the shipper of freight. As a result, over long distances there is little inter-modal competition for the passenger. Airlines, because of great time advantages, command the great share of the market. Business traffic will prefer air. A large portion of the leisure market is subject to time constraints and given the speed and comfort compared to the ground mode over longer distances, and the advantages that flow from the taper in fares as distance increases, a substantial portion of the leisure market is also a captive of the airlines. For special reasons relating to the nature of the trip where no time constraints apply, some will make use of ground modes for leisure travel over long distances. This smaller group will be interested in the competitive relationship between a long distance bus charter and a transcontinental train journey. The private automobile for family travel will retain an important but lesser place in this market as well.

In the middle ranges of travel an area of overlap exists where all modes of transportation have the opportunity to compete. The rail and road modes are reasonably competitive in terms of inter-city travel and in a range which runs somewhere between two hundred miles to five hundred miles they become competitive with air. The factors relating to the relative importance placed upon time as related to cost within this distance range are by no means clearly established. The business traveller and some leisure travellers will, within that range of distance, prefer the air mode so long as it offers time advantage of significance and the difference in cost over the surface modes is not too great. As the difference between surface fares and the air fares increase and time differential decreases, passengers tend to swing to surface modes. Within this flexible band, some degree of competition for the passenger exists between modes while the potential for an even greater degree of competition is present if a basis of complete self-sufficiency to produce more genuine competitive conditions can be established.

At present, competition is unequal in several respects. Rail fares within this distance band are uneconomic and subsidized to a substantial degree. Air fares appear to have had an element of cross-subsidization in that they reflect some but not all the higher costs associated with short distance movements. Whether this is equally true in other modes has not been established but appears to be a possibility in the air mode at shorter distances. The range of inter-modal competition can be lowered somewhat to probably 50 or 75 miles in high density situations if STOL service proves that it can form a continuing part of the Canadian transportation structure. It is a somewhat expensive form of air movement at present and its role will depend on government's decisions regarding self-sufficiency or subsidy. Its attractiveness to the customer has been demonstrated but its acceptability at full cost recovery has not.

The full competitive relationship between all three modes plus the addition of the private auto applies only to those communities which have between them both air and rail service as well as road connections and bus service. More detailed information on this is available in Section VII. The larger Canadian cities receive service from all four modes and represent the vast bulk of the Canadian population but there are many small communities which are dependent solely on bus service and the private auto.

Even to the extent competition does exist between modes it is unbalanced in the sense that the modes are not treated on an equal basis. Measured in terms of the degree of governmental assistance given to the modes to subsidize passenger movement, the bus which is at or close to self-sufficiency is at a disadvantage compared to the substantial financial assistance direct or indirect, given to the air and rail modes, while the air mode stands in a favourable light compared to the even higher subsidy aid to the rail passenger.

As noted in another section and using 1972 data, the indirect subsidy per passenger-mile on roads is in the nature of .63 cents per passenger-mile but that within this context the motor coach is in fact carrying itself and apparently paying its full share to a greater degree than the private auto. On the other hand, using the 1972 data for the air and rail modes, because of government assistance in the provision of infrastructure, each passenger on the air mode was receiving a subsidy of 2 cents for every mile travelled while each rail passenger was receiving a subsidy of 5 cents for every mile travelled.

## SUMMARY

To sum up, while there is limited inter-modal competition in the passenger field, it has its largest area of operation in the short to middle distance ranges. It is unbalanced because of unequal degrees of government support by mode. At longer distance the air mode is dominant, and at the shortest distances the bus is dominant except in those cases where rail operates. Reliance on the principle of inter-modal competition as the principal basis for passenger transportation policy is insufficient. Inter-modal competition should be allowed to work where it can exist effectively but since its coverage is limited, more is needed to supplement it.

## 2. INTRA-MODAL

While reliance in the National Transportation Act on competition as a prime factor specifies competition between modes, in the passenger field intra-modal competition is a possible additional feature for use. At the present time it exists only in the air mode where it is incomplete but widespread in effect.

The railways do not and are not likely to compete with each other for passengers. What is needed in the rail mode is joint rationalization, not competition. In the motor coach field under provincial regulation, the principle of monopoly route assignment has been followed and the usual theory that stability and better service through economies of scale can be achieved by this approach has been accepted up to this time.

In the air mode, competition while not universal, exists on a fairly substantial scale. Air Canada has C.P. Air as a competitor on its major transcontinental operations from Montreal west on the highest density and most lucrative routes although competition has been limited by a formula

that limits C.P. Air to 25 percent of capacity. East of Montreal, the regional carrier, Eastern Provincial, has been authorized to engage in some competition with Air Canada and, elsewhere, there has been limited emergence of regional carrier competition with Air Canada and C.P. Air on some direct and indirect routings. The principal regional and local routes assigned to regional and third level carriers, as well as the C.P. Air domestic routes in Northern British Columbia and the Yukon, are monopolies.

With continued growth, some further competition in the air mode may emerge. In the motor coach area, the ability of some stronger routes to support competition may be justified, but the possibility has not been examined. In the rail area, competition for the passenger will remain virtually non-existent.

Intra-modal competition at present is also too limited to justify primary reliance on it to achieve overall adequacy and economic efficiency in passenger transportation. However, in the large long-haul market where the air mode is and will remain dominant (and where inter-modal competition is of little effect), the existence of intra-modal air competition does supplement the main weakness in inter-modal competition. No similar supplement exists at the other end of the scale where, on short-haul routes, the bus is dominant and operates on a non-competitive basis, except where its route segments are paralleled by rail.

SUMMARY AND RECOMMENDATION

Taken together, the intra-modal competition in air, particularly applicable over longer ranges, and the inter-modal competition on medium and some short range segments provide jointly a substantial competitive force. It is a major instrument in regard to both cost-efficiency and competitive rates, but not sufficiently all-embracing to justify placing full reliance on it in the field of rates. Its best effectiveness cannot be achieved unless the modes are placed on a basis of equal treatment.

## SECTION XI: INTER-MODAL COORDINATION

### A. CARRIER ACTIVITY

The recognition in the National Transportation Act of the need to make the best use of each mode of transport implies not merely a role for each mode, but a relationship between the modes which will serve the public interest. The Act assumed that, in part, improved coordination between the modes would result from the interplay of the competitive market forces which are emphasized in Section (3) of the Act and, in part, from the activities of the Canadian Transport Commission in planning and regulation.

The principal areas where improved coordination can be sought are as follows:

- (a) relationship between the route networks of separate modes to provide the best through service to the passenger involving more than the use of a single mode; primarily here, the emphasis is on route planning and route relationships;
- (b) inter-carrier relationships in regard to joint and connecting schedules and through fares which will simplify the passenger journey where more than one mode is involved; and
- (c) problems centering around terminals, their inter-connection and their distribution facilities; these run from such issues as the establishment of joint terminals serving more than one mode (actual departure and origin points or collector points); the adequacy of connections between terminals of different modes; and the local distribution systems existing at terminals.

Relatively little has been achieved in regard to these inter-modal issues since the passage of the National Transportation Act. Reliance on carrier initiative has not produced inter-modal route planning. The C.N.R. has shown interest in some rail-bus relationships but, for a variety of reasons (e.g. the lack of a single overall regulatory or planning authority, and the division of jurisdiction between the federal and provincial authorities), these initiatives have not produced major results.

As for through trips and through fares with scheduled inter-connections between modes, relatively little has been accomplished on carrier initiatives. A few inter-modal through fare arrangements exist largely as a result of particular market efforts aimed at tour programmes.

Joint terminal planning is lacking. At the urban transit level, there have been some isolated attempts at joint terminal planning which relate primarily to urban transit activities rather than inter-modal inter-city activity. In theory, a joint terminal could serve either/or both rail and bus operations and, at the same time, act as a collector or distribution centre for a local airport. Ideas of this sort take a long time to develop because terminal structures are built only at periodic intervals, but even so there is little indication of planning in this direction based on carrier initiatives, although the idea has been discussed in broad terms in two or three larger metropolitan communities.

Similarly, special connections between separated modal terminals have not emerged on any significant basis. There has been a broader approach in relation to road distribution patterns to and from major airports; there the Air Administration has made progress with provincial and local authorities.

B. GOVERNMENT ACTIVITY

The situation is not much better at the governmental level. The National Transportation Act required the Canadian Transport Commission to report to the Minister upon measures that should be adopted to achieve co-ordination in development, regulation and control of the various modes of transport. While some good research studies on relationships between modes have been prepared within the Commission, little has been done to initiate, in the planning process or in the regulatory process, positive lines of action designed to develop inter-modal co-ordination relating to the various topics described above. Planning can only be transformed into effective implementation through proper use of a planning process in conjunction with the regulatory process. In part, this seems to be a problem of a traditional approach to regulatory activities within particular modal committees; in part, it may arise from legislative weaknesses and need for some change in machinery of government and clarification in the legislation.

Evidence in more than one country suggests that regulatory committees when confronted with a particular problem which might be possible of solution on an inter-modal basis, have tended to look at the issue in terms of the particular mode for which they are responsible. The C.T.C. has made some efforts to develop an inter-modal approach. Commission members have been designated to sit on more than one modal committee while a review committee composed of the Chairmen of the various modal committees has been established. However, whatever the reason, the total results have not been impressive. The legislation dealing with regulation is framed in terms of a modal approach and requires examination to ensure that the Commission has

the authority to go beyond the bounds of a single mode. Inter-modal co-ordination is a matter in the first instance of integrated planning before it becomes a matter for administrative or regulatory implementation; and the situation with regard to responsibility for the policy planning process needs to be clarified. Finally, full inter-modal co-ordination whether at the planning or the administrative or regulatory level, is impeded because road transport is under separate jurisdiction.

In summary, inter-modal co-operation has not been achieved on a satisfactory basis, either as a result of the workings of the market process, the initiatives of individual carriers or the working of government processes.

#### RECOMMENDATION

Action needs to be taken to ensure that the regulatory authority has the necessary authority and is directed to approach all passenger modes as part of a single whole in resolving passenger issues which come before them; and supplementary action to provide, within the Ministry, policy support for inter-modal planning, and monitoring which will ensure an integrated approach, including advice on investment allocation and equitable treatment of modes; to be complete this should in some form involve provincial participation.

## SECTION XII: CARRIER OPERATIONS

### PRODUCTIVITY AND COSTS

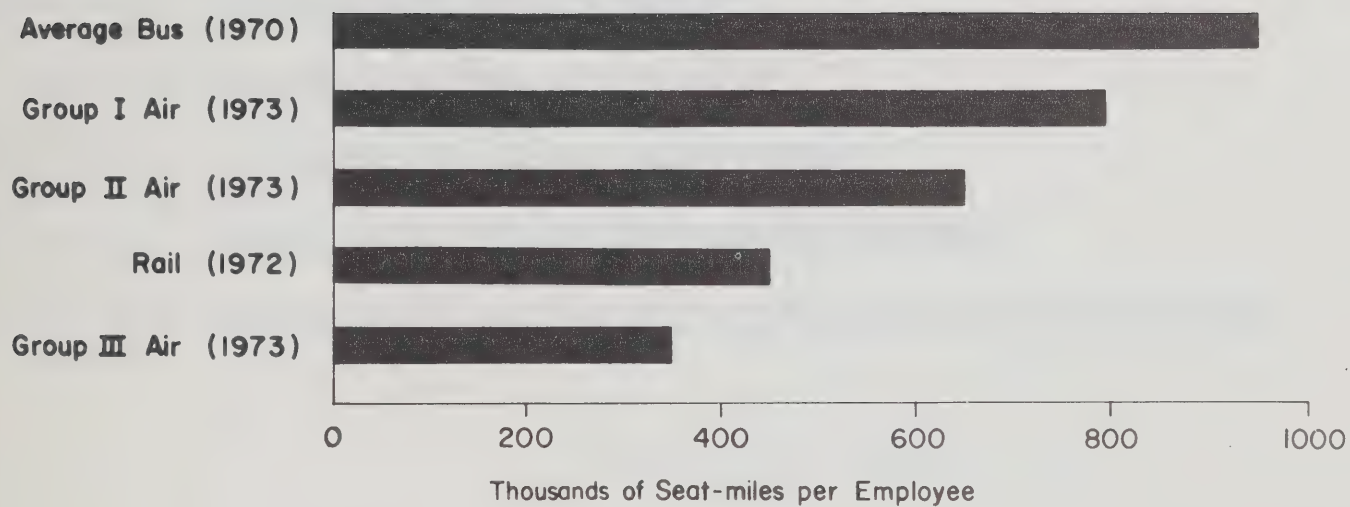
Figure XII-1 gives a measure of carrier output in terms of total staff. "Total employee" includes all carrier personnel, and only carrier personnel; in the case of rail, this figure represents the passenger share of total rail operations. The relative simplicity of the bus and bus operations are reflected in high productivity in terms of passenger miles per employee. The trunk and regional airlines are also relatively high in spite of the complexity of aircraft and the passenger service system, e.g. seat reservations, due to acceptance of automation in several areas of operation. The lower ranking for rail passenger services is due to a comparatively high proportion of maintenance employees, while the third level air carriers are out of line with the other modes in terms of the relative numbers of operating personnel.

Another measure of productivity, cost-per-seat-mile for the various modes is shown in Figure XII-2. "Total Operating Costs" is the cost borne by the carrier for the operation of vehicles, rolling stock and aircraft.

An overall figure has been used for rail, although substantial variation occurs due to route differences, types of service, power plant differences, etc. The figure shown is an estimate for inter-city day trains. The total cost for passenger trains in 1972, including overnight and trans-continental trains, was 5.3 cents per passenger mile.

Two costs have been shown for cars: one at 70 mph and one at 50 mph average speeds. The difference due to speed alone is approximately 20%.

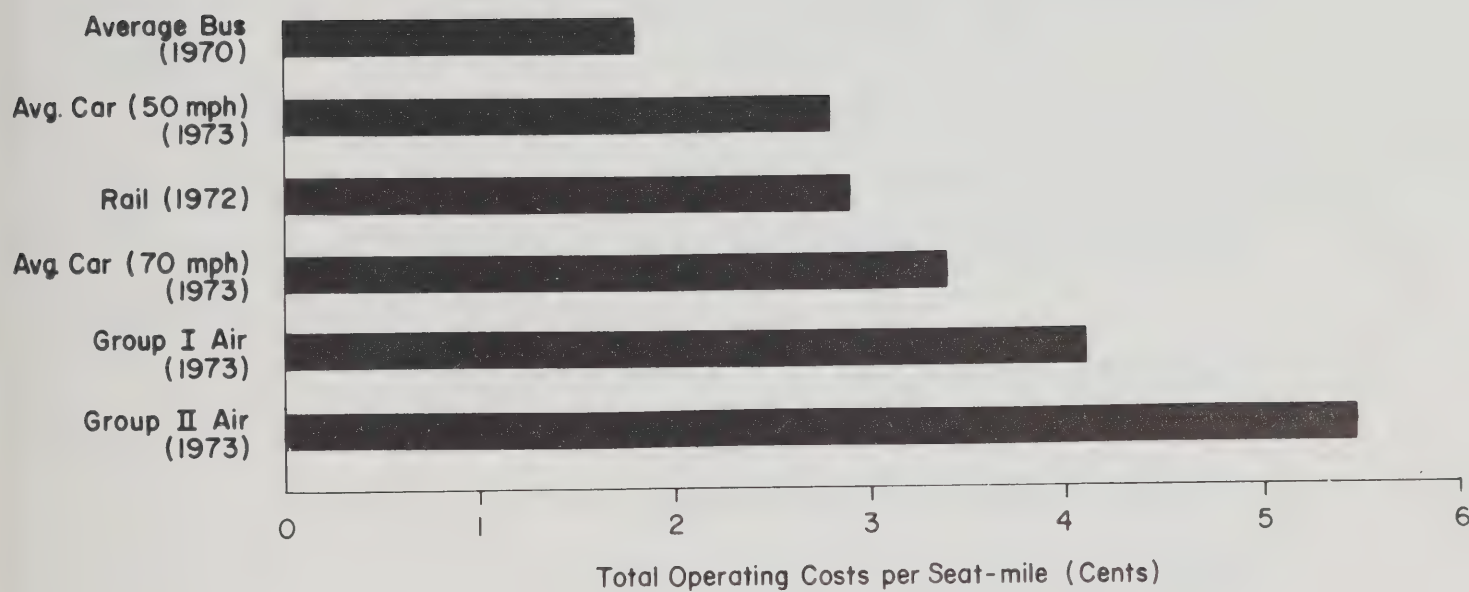
Bus is at least 50% better than the nearest competitive mode, and air is the most expensive.



## PRODUCTIVITY

XII-1





## OPERATING COSTS PER SEAT MILE

XII-2



These values show the cost of providing an available service, and should be looked at in conjunction with Figure XII-3 which shows costs and revenues in terms of actual service, i.e. passenger-miles. These costs are of course carrier costs and do not include air or road infrastructure deficits.

As might be expected from the previous figures, the bus is more economical in terms of actual service than all other modes, both to the carrier and the passenger. Both bus and air carriers show favourable margins of revenue over cost for the carriers.

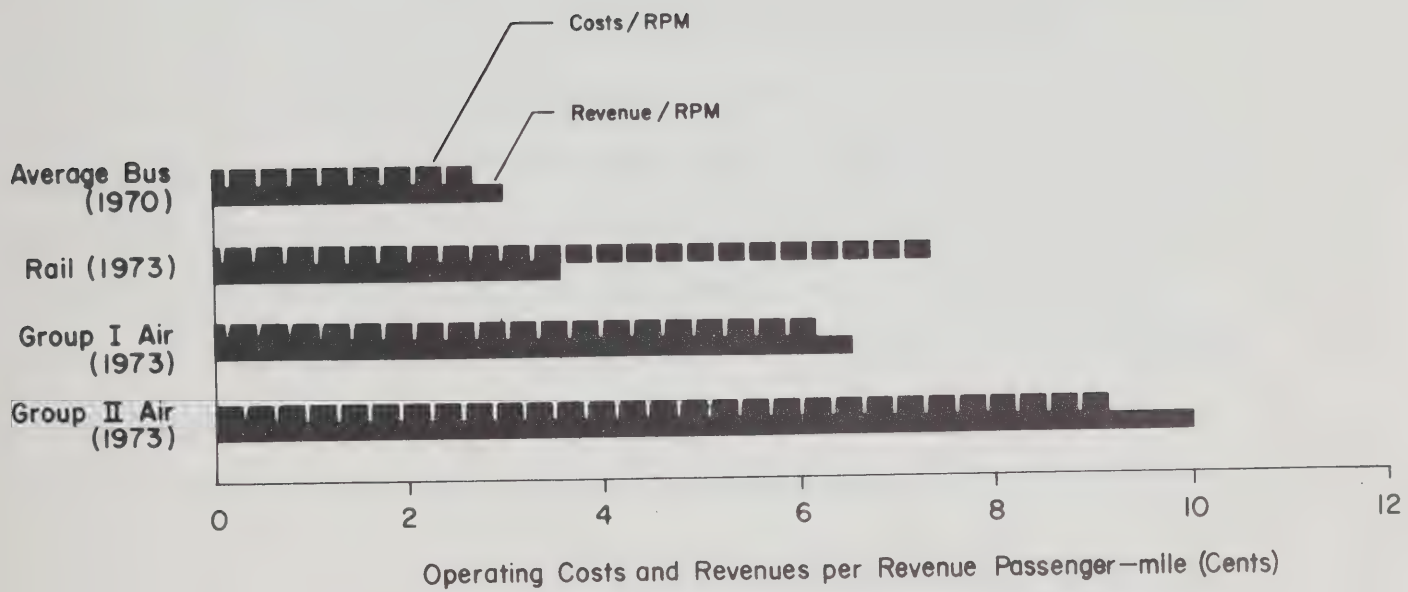
Rail is close behind bus in revenues, but rail revenues are approximately 50% of costs over the entire Canadian rail system. The difference is partially made up in operating subsidies with the balance coming from other carrier revenues. The gap is so great that it needs to be narrowed from both sides, i.e. an increase in revenues from increased fares and higher load factors, and reduced costs from higher speeds and utilization, and reduced maintenance. Significant improvements in technology and in operations are necessary if rail passenger service is to become profitable even in those high density areas where it has a chance of self-sufficiency.

Up to 1990, relatively small productivity changes are expected in the bus mode. Changes in aircraft and operating methods are expected to increase the productivity of air services by up to 20% as noted in another section.

#### PROFITABILITY

The ownership of carriers in Canada is mixed, but includes a substantial private ownership component. The industry already has a heavy capital investment and will require substantial capital in the future. Profits are required to finance these capital expenditures unless government undertakes this responsibility.





## COSTS AND REVENUES

XII-3



The private component has, in the main, raised its external funds on private capital markets. Publicly-owned carriers have raised most of their external capital requirements by loans from their owner-governments, although there have been cases of government-owned entities also raising funds on the private capital markets, relieving capital pressures on government.

The profitability of a company has a direct bearing on its ability to raise funds on the private market. The record of Canadian carriers in terms of profitability has not been particularly good -- in some areas quite poor. Moreover, profitability, not so much in terms of achieving high earnings but in the primitive sense of avoiding loss, is also one of the best stimuli to efficiency, productivity and control of costs both at management and employee levels. Table XII-1 shows the operating profits as a percentage of revenues for the Level 1 and Level 2 air carriers. The railways, of course, have losses on passenger operations. In 1969, net operating profit for the bus industry was approximately 11% of revenue.

TABLE XII-1

Operating Profits (Losses) of Air Carriers as a Per Cent of Operating Revenues

|                    | <u>1973</u> | <u>1972</u> | <u>1971</u> | <u>1970</u> |
|--------------------|-------------|-------------|-------------|-------------|
| Air Canada         | 6.6         | 7.8         | 5.6         | 4.4         |
| CP Air             | 5.6         | 7.4         | 5.9         | 4.4         |
| PWA                | 8.4         | 9.9         | 10.7        | 3.4         |
| Nordair            | 12.2        | 11.3        | 16.4        | 15.1        |
| Eastern Provincial | 2.7         | 1.6         | 2.4         | (4.6)       |
| Quebecair          | 11.6        | 10.2        | 6.1         | (9.9)       |
| Transair           | 7.3         | 10.2        | 3.4         | 1.9         |

Source: Statistics Canada Catalogue 51-206.

The relationship between debt and equity in the capital structure of a company also has a direct bearing on its profitability, on its treatment in the capital markets and on financial stability, including ability to withstand vagaries and pressures. Most companies achieve a reasonable balance between equity and debt, with the former predominating (a sixty to forty ratio has been referred to as a useful rule of thumb). Incomplete information on the Canadian carriers suggests varying degrees of debt burden with some need for additional equity in both bus and air companies in several cases. The worst position exists with regard to the two largest crown-owned carriers, CN and Air Canada. In these, debt is completely out of line with equity. Debt-equity ratios for the major air carriers in Canada are shown in Table XII-2. This makes their measurement, their treatment and their reaction as efficient commercial entities functioning in any private commercial market-place difficult. A profitable position is of major significance where need for more equity exists, just as it is in the case of debt funds.

TABLE XII-2

Long-Term Debt to Equity Ratio for Air Carrier

|      | <u>Air<br/>Canada</u> | <u>CP Air</u> | <u>PWA</u> | <u>Nordair</u> | <u>Eastern<br/>Prov.</u> | <u>Quebecair</u> | <u>Transat</u> |
|------|-----------------------|---------------|------------|----------------|--------------------------|------------------|----------------|
| 1973 | 7.8                   | 2.2           | 1.1        | 0.9            | 1.2                      | 1.3              | 0.             |
| 1972 | 8.4                   | 1.4           | 1.0        | 1.8            | 0.5                      | 1.6              | 0.             |
| 1971 | 10.5                  | 1.7           | 1.2        | 1.9            | 0.7                      | 2.3              | 0.             |
| 1970 | 9.5                   | 1.7           | 2.0        | 1.9            | 5.5                      | (14.8)           | 0.             |

Source: Statistics Canada Catalogue 51-206.

Transportation policy, both in definition of objectives and in the administrative and regulatory approach, has not paid enough attention to these forces and their interrelationship.

The consequences in terms of government financial burdens over the longer run are likely to be:

- (a) in an inefficient industry, from the cost point of view, higher fares and more pressures for subsidies;
- (b) in an unprofitable industry, possible need for total nationalization ultimately; and, in the meantime, because of difficulty in financing, greater or even total need for government financing of capital requirements or government guarantees of financing.

Levels of desirable profitability need not be specified at this time; further study would be required. Air carrier rates of return on invested capital are shown in Table XII-3. In an industry such as transportation where regulation exists and where the capital market recognizes that this, combined with overall government interest, creates a degree of stability that does not exist in unregulated private markets, a lower return on assets or investment seems to be acceptable. Further, public expectations with regard to government-owned corporations indicates that the achievement level, if not their target, should be in the middle rather than in the forefront of the pack. They should, however, be subject to the same general rules.

TABLE XII-3

A. "Invested Capital" (Long Term Debt plus Equity)

|      | <u>Air<br/>Canada</u> | <u>CP Air</u> | <u>PWA</u> | <u>Nordair</u> | <u>Eastern<br/>Prov.</u> | <u>Quebecair</u> | <u>Transair</u> |
|------|-----------------------|---------------|------------|----------------|--------------------------|------------------|-----------------|
|      | - 000 dollars -       |               |            |                |                          |                  |                 |
| 1973 | 779,046               | 142,890       | 50,014     | 31,102         | 22,919                   | 16,573           | 13,177          |
| 1972 | 716,215               | 126,075       | 39,786     | 30,758         | 12,006                   | 14,429           | 12,035          |
| 1971 | 691,773               | 124,765       | 30,540     | 21,961         | 10,124                   | 13,019           | 11,661          |
| 1970 | 605,107               | 120,171       | 28,408     | 17,448         | 24,820                   | 13,570           | 9,151           |

B. Net Income After Tax Plus Interest Expense

|      | <u>Air<br/>Canada</u> | <u>CP Air</u> | <u>PWA</u> | <u>Nordair</u> | <u>Eastern<br/>Prov.</u> | <u>Quebecair</u> | <u>Transair</u> |
|------|-----------------------|---------------|------------|----------------|--------------------------|------------------|-----------------|
|      | - 000 dollars -       |               |            |                |                          |                  |                 |
| 1973 | 46,072                | 11,160        | 4,259      | 3,942          | 2,013                    | 2,192            | 1,670           |
| 1972 | 41,135                | 10,825        | 3,813      | 1,900          | 1,355                    | 1,729            | 1,533           |
| 1971 | 33,524                | 8,855         | 3,563      | 2,174          | 2,321                    | 947              | 633             |
| 1970 | 30,848                | 7,418         | 1,860      | 1,666          | 1,279                    | 1,675            | 338             |

C. Return on "Invested Capital" (B/A as %)

|      | <u>Air<br/>Canada</u> | <u>CP Air</u> | <u>PWA</u> | <u>Nordair</u> | <u>Eastern<br/>Prov.</u> | <u>Quebecair</u> | <u>Transair</u> |
|------|-----------------------|---------------|------------|----------------|--------------------------|------------------|-----------------|
|      | - 000 dollars -       |               |            |                |                          |                  |                 |
| 1973 | 5.9                   | 7.8           | 8.5        | 12.7           | 8.8                      | 13.2             | 12.7            |
| 1972 | 5.7                   | 8.6           | 9.6        | 6.2            | 11.3                     | 12.0             | 12.7            |
| 1971 | 4.8                   | 7.1           | 11.7       | 9.9            | 22.9                     | 7.3              | 5.4             |
| 1970 | 5.1                   | 6.2           | 6.5        | 9.5            | 5.2                      | 12.3             | 3.7             |

However, the recognition of a principle recognizing the need for some reasonable measure of profitability has implications going beyond the stimulus to cost-efficiency, productivity and the ability for financing on the capital market. It carries implications for the philosophy on rate control because the need to avoid loss or achieve profit is the principal reason for fare increases.

If the need and the right of the carriers to operate within some agreed umbrella of profitability is recognized, then the same set of principles must recognize the right of the public to be satisfied as to the reasonableness of the carriers' approach to those factors which have created the request for rate increases. These cannot be excessively detailed but should, at least, relate to broad cost-efficiency; and operational practices, such as excessive capacity or internal rate variations that have led to undesirable uneconomic results (e.g. too much or too heavy reliance on discount fare promotion).

In theory, omission of a transportation principle recognizing the need for profitability should permit simpler rules in regard to rate control. In practice, because the competition in the passenger field is incomplete, some degree of rate supervision is necessary anyway and the inclusion of this principle can be fitted in with the approach to passenger rates suggested elsewhere. Carriers need to recognize that acceptance of any principle of profitability or return on investment in their interests (and most seem to like the idea) carries with it consequences in terms of the right of the user to reasonable knowledge as to the carriers' overall performance. On balance, however, the case for recognition of the principle is stronger than the case against it. It has worked to advantage in a number of cases in other countries.

#### COSTS BY DISTANCE

A significant aspect of passenger transportation is the variation of costs over distance. An analysis (Table XII-4) was made on the airline cost per passenger on flights of different lengths expressed as a ratio of the costs for a 500 mile trip. These are compared with the 1973 fare structure similarly expressed as a ratio to the 500 mile journey. This Table suggests that the cost of a 2,000 mile journey is less than double that of a 500 mile journey, while the 1973 fare is more than triple. Further analysis and discussion with airlines is needed on this particular result.

A similar cost analysis of rail operations was made and the results are shown in Figure XII-4. The reason costs appear to rise for distances over 200 miles is that, in this range, dining cars, sleeping cars and other supplementary services are added to the trains. Additional data still under analysis suggests that shorter rail distances may also be underpriced in relation to costs more than longer trips. Here again more analysis will be undertaken.

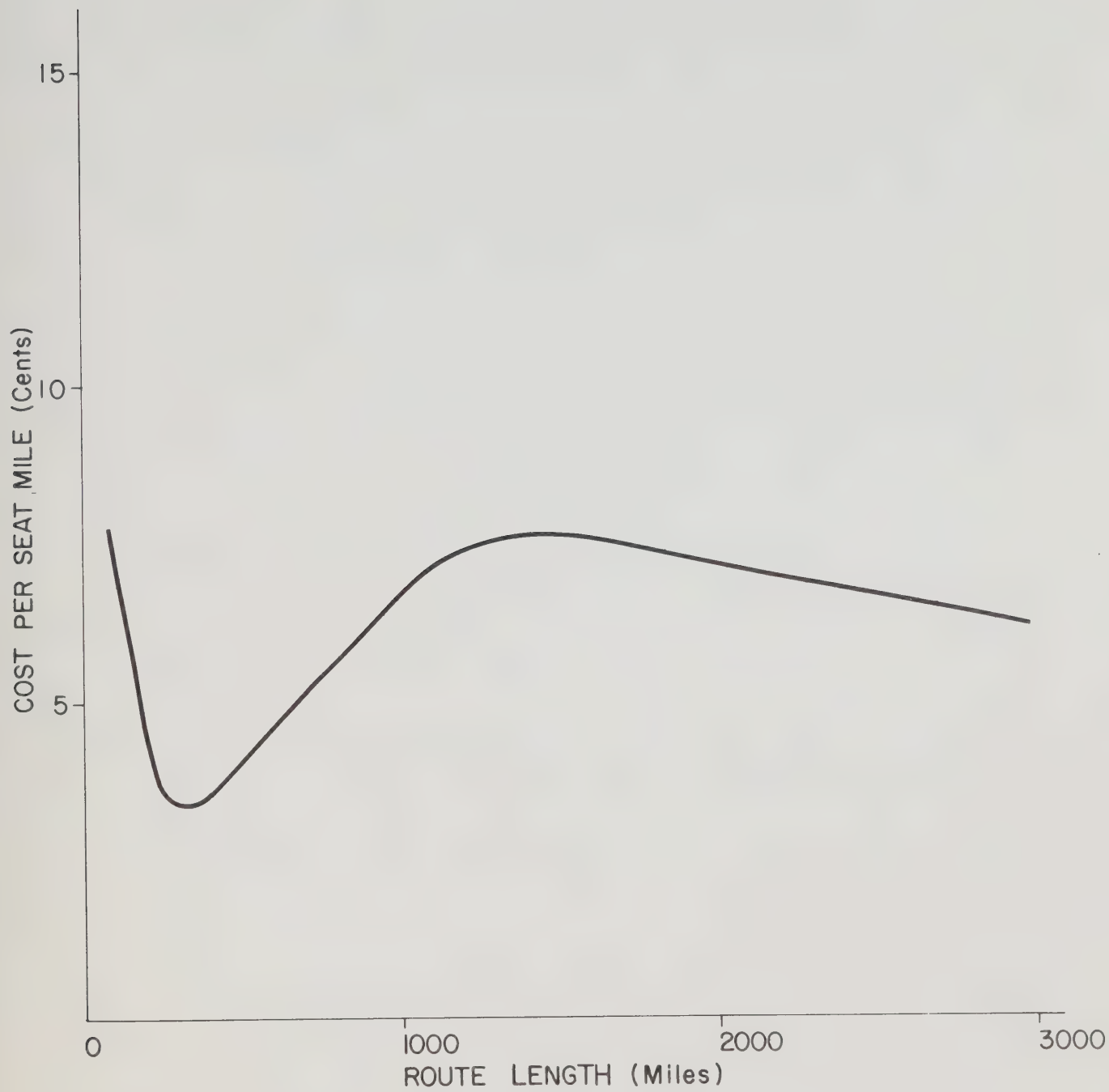
Long distance bus costs should also vary in the same way but lack of route specific cost data makes it difficult to analyze results.

TABLE XII-4 AIR

AIRLINE COSTS AND FARES AS THE RATIO  
OF COST AND FARES FOR 500 MILES

| <u>Distance</u><br><u>(Miles)</u> | <u>Cost</u><br><u>Ratio</u> | 1973<br>Fare<br><u>Ratio</u> |
|-----------------------------------|-----------------------------|------------------------------|
| 100                               | 0.72                        | 0.42                         |
| 150                               | 0.74                        | 0.49                         |
| 200                               | 0.77                        | 0.56                         |
| 300                               | 0.86                        | 0.71                         |
| 400                               | 0.92                        | 0.85                         |
| 500                               | 1.00                        | 1.00                         |
| 600                               | 1.06                        | 1.15                         |
| 700                               | 1.11                        | 1.29                         |
| 900                               | 1.27                        | 1.58                         |
| 1100                              | 1.38                        | 1.87                         |
| 1500                              | 1.66                        | 2.46                         |
| 1800                              | 1.83                        | 2.89                         |
| 2000                              | 1.98                        | 3.19                         |
| 2200                              | 2.10                        | 3.48                         |





RAIL COSTS PER SEAT MILE



RECOMMENDATIONS

- (a) The government should accept the principle of commercial self-sufficiency in terms of a reasonable measure of profitability for the common carriers, both to avoid unnecessary financial burdens on government and as one means of ensuring reasonable economic efficiency. The details of any utilization in relation to the rate-making process would be developed later.
- (b) As part of this general approach, action should be taken with the crown-owned carriers to establish a much more reasonable relationship between equity and debt in their financial structures.
- (c) Subject to the decision to be taken in regard to the economic position of infrastructure provided by government, including the user charge issue, the same principle of a target profitability should be applied to the operation of these facilities.
- (d) If a reasonable relationship is to be maintained between costs and fares, the nature of the cost taper over distance should be reflected adequately in the fare structure.

### SECTION XIII: GOVERNMENT FINANCIAL ASSISTANCE

Government financial assistance is provided in two ways, in direct operating subsidies and, more importantly, in the provision of infrastructure for transport services.

#### OPERATING SUBSIDIES

No direct subsidies are paid for the two road modes, bus and private automobile, by the federal government. Direct air subsidies are less than \$2 million per year to two regional carriers, Eastern Provincial Airways and Quebecair.

The largest operating subsidy is the rail passenger subsidy under Section 261 of the National Transportation Act. This allows the C.T.C. to pay 80% of the losses of a necessary passenger service. This will reach approximately \$135 million for 1974 and an analysis has indicated that this will rise to over \$310 million in 1980.

In addition, operating subsidies are paid to certain water carriers who operate the major ferries and passenger and cargo services to isolated areas. Table XIII-1 shows the level of these subsidies for 1973-74.

#### INFRASTRUCTURE SUBSIDIES

The government provides infrastructure support to the road, and air modes. In return, special fuel and other taxes and charges to the air carriers are levied to pay for the infrastructure. Estimates of the total costs (including charges for the use of capital), are shown in

TABLE XIII-1

1973-74 FEDERAL GOVERNMENT  
WATER CARRIER SUBSIDIES

|                           | <u>SUBSIDY</u><br><u>(\$ ,000)</u> |
|---------------------------|------------------------------------|
| Newfoundland Gulf - CN    | 33,129                             |
| - Others                  | 2,234                              |
| Prince Edward Island - CN | 8,348                              |
| - Others                  | 2,000                              |
| Newfoundland Central - CN | 15,639                             |
| - Others                  | <u>460</u>                         |
| SUBTOTAL                  | 61,809                             |
| Nova Scotia/New England   | 774                                |
| West Coast                | 923                                |
| Quebec North Shore        | 732                                |
| Magdalen Islands          | 655                                |
| Miscellaneous             | <u>852</u>                         |
| SUBTOTAL                  | 3,936                              |
| GRAND TOTAL               | <u><u>65,745</u></u>               |

Tables XIII-2 and XIII-3. These are not entirely passenger costs and revenues as the air infrastructure is used for cargo and general aviation aircraft and, of course, roads are used by trucks. The air infrastructure costs are entirely those of the federal government but road expenditures are made by municipal, provincial and federal governments. In 1972, federal government roads expenditure was \$182 million or about 7% of the total \$2,691 million actually spent by all levels of government on roads in that year.

Within the road mode, analysis done by the C.T.C. indicate that the intercity buses appear to be paying for their use of the roads, that is, the intercity bus mode is not subsidized, either directly or through the infrastructure.

TABLE XIII - 2

A I R

CIVIL AVIATION INFRASTRUCTURE COSTS AND REVENUES IN CANADA 1954-1973\*

(In Millions of 1973 Constant Dollars; Rate of Cost of Capital: 6 Percent)

|      | Annual<br>Costs (\$M) | Annual<br>Revenues (\$M) |                  | Revenues as a Per-<br>centage of Costs |                  |
|------|-----------------------|--------------------------|------------------|--|------------------|
|      |                       | Gross <sup>1</sup>       | Net <sup>2</sup> | Gross <sup>1</sup>                     | Net <sup>2</sup> |
| 1954 | 120                   | 23                       | 18               | 19                                     | 15               |
| 1955 | 126                   | 36                       | 21               | 28                                     | 16               |
| 1956 | 136                   | 24                       | 21               | 17                                     | 15               |
| 1957 | 148                   | 24                       | 20               | 16                                     | 14               |
| 1958 | 172                   | 29                       | 26               | 17                                     | 15               |
| 1959 | 188                   | 30                       | 27               | 16                                     | 14               |
| 1960 | 203                   | 32                       | 28               | 16                                     | 14               |
| 1961 | 222                   | 39                       | 33               | 17                                     | 15               |
| 1962 | 228                   | 39                       | 34               | 17                                     | 15               |
| 1963 | 229                   | 40                       | 36               | 18                                     | 16               |
| 1964 | 256                   | 50                       | 42               | 19                                     | 16               |
| 1965 | 258                   | 51                       | 44               | 20                                     | 17               |
| 1966 | 262                   | 51                       | 44               | 20                                     | 17               |
| 1967 | 279                   | 63                       | 52               | 22                                     | 19               |
| 1968 | 276                   | 76                       | 60               | 28                                     | 22               |
| 1969 | 276                   | 86                       | 69               | 31                                     | 25               |
| 1970 | 290                   | 92                       | 74               | 32                                     | 26               |
| 1971 | 307                   | 96                       | 76               | 31                                     | 25               |
| 1972 | 328                   | 103                      | 83               | 31                                     | 25               |
| 1973 | 354                   | 111                      | 89               | 31                                     | 25               |

\* Update of Table 1 in Z. Haritos, "Transport Costs and Revenues in Canada", Journal of Transport Economics and Policy, Volume IX, No. 1, January 1975.

<sup>1</sup> Includes Provincial Aviation Fuel Tax Revenues.

<sup>2</sup> Excludes Provincial Aviation Fuel Tax Revenues.

Revised 11/4/75

TABLE XIII - 3

R O A D

ROAD COSTS AND REVENUES IN CANADA\*

(In Millions of 1973 Constant Dollars; Rate of Cost of Capital: 6 Percent)

|                   | <u>Annual<br/>Costs (\$M)</u> | <u>Annual<br/>Revenues (\$M)</u> | <u>Revenues as a Per-<br/>centage of Costs</u> |
|-------------------|-------------------------------|----------------------------------|--|
| 1955              | 1128                          | 777                              | 69   |
| 1956              | 1177                          | 800                              | 68   |
| 1957              | 1205                          | 890                              | 74   |
| 1958              | 1284                          | 938                              | 73   |
| 1959              | 1372                          | 980                              | 71   |
| 1960              | 1439                          | 1019                             | 71   |
| 1961              | 1541                          | 1143                             | 74   |
| 1962              | 1659                          | 1189                             | 72   |
| 1963              | 1796                          | 1266                             | 71   |
| 1964              | 1931                          | 1382                             | 72   |
| 1965              | 2097                          | 1419                             | 68   |
| 1966              | 2227                          | 1430                             | 64   |
| 1967              | 2392                          | 1526                             | 64   |
| 1968              | 2514                          | 1805                             | 72   |
| 1969              | 2608                          | 1870                             | 72   |
| 1970              | 2793                          | 1863                             | 67   |
| 1971              | 2932                          | 1943                             | 66   |
| 1972 <sup>1</sup> | 3070                          | 2028                             | 66   |
| 1973 <sup>1</sup> | 3191                          | 2041                             | 64   |

\* Update of Table 3 in Z. Haritos, "Transport Costs and Revenues in Canada", Journal of Transport Economics and Policy, Volume IX, No. 1, January 1975.

<sup>1</sup> Estimated.

## SECTION XIV: MODAL ROLES

### THE ROLE OF THE PRIVATE AUTOMOBILE

The best role for each commercial mode of passenger movement cannot be determined without first reaching some conclusions about the future of the private automobile. As the previous data has indicated it is so large that it dwarfs all other passenger modes combined.

Its flexibility and comfort make it the most attractive family and personal mode; indeed rural areas could not survive without it. Its total role in the economy, direct and indirect, is so great that substantial change in too short a time frame could have serious economic consequences.

Equally as seen from the foregoing data the automobile is by far the most expensive mode, as presently used, although its costs improve greatly if fully loaded. It is the most dangerous mode; a major source of congestion in higher density areas; inefficiently used in terms of loads and peak periods; the largest source of pollution and energy consumption; and most subject to weather vagaries.

In terms of its role in the social and economic environment it will continue to be the largest factor in passenger movement for many years to come, but some gradual change in this role should be sought. While sudden change would be disruptive to the economy and unacceptable in terms of life style unless forced by unavoidable external events, sudden change would also completely overload the commercial carriers. As a broad indicative figure, a ten percent transfer from the private auto to the commercial modes could involve a fifty percent increase in their business in addition to their normal growth, -- something that might be feasible over a period, -- but not in any very short time span.

The auto does possess large possibilities for improvements in nature and in use. Along with air it has the greatest potential for technological change -- more efficient engines and vehicles. In addition, there is a wide variety of taxing, pricing, and other indirect and direct methods of achieving more efficient use. These run from variations in taxing (purchase, licensing, fuel, etc.) to variable pricing in regard to actual usage (by region or locality by load factor, by time or season of use). There are new concepts to be explored -- such as increased combinations of use of commercial carrier and auto rental (already a major feature of the air mode); and other techniques such as the auto-carrying train/or even aircraft-ferry) all worthy of some consideration.

The need to transfer people from autos to urban transit systems has already been accepted although urban transit is not a part of this report. In addition, it would be desirable to try to achieve a modest transfer from the private auto to the intercity common carrier, as well as seeking more efficient private vehicles and more efficient use. It would be premature without further study and consultation to decide whether the role of the auto should be "frozen" so that its relative growth in terms of availability and use is not greater than the growth of the country. Much opinion suggests that it would at least be desirable if its relative rate of growth and its role as a whole could at least be slowed up somewhat.

With a major part of jurisdiction and economic responsibility resting with the provinces, no comprehensive programme could be launched without discussion with them. Current inconsistencies of approach emphasize the need for this; for example, although the need for encouragement of use of smaller cars appears generally accepted, this has been reflected in the license fee policy changes in only three provinces. In all the others, over a five year period, the increases in license fees were percentage-wise heavier on small cars than on large.

#### RECOMMENDATION

The need to achieve more efficient private automobiles and more efficient use thereof which appears to be implicit in governmental policies at all levels should be broadened to include a gradual and modest transfer of passengers from the private auto to intercity commercial carriers. An objective of from 5% to 10% may not be unreasonable and would over a period of years have minimal impact on the total industry, given normal growth rates.

The means by which this can be achieved, as well as the degree and rate, should be a prime subject for consultation between federal and provincial authorities as part of a total transportation program.

## AIR

This is the most costly mode but, in a time-conscious society, will and should remain the dominant mode for long-haul. It can also play a major role at medium distances if material time-saving over ground movement is available, although at these medium distances, the element of choice for the passenger in balancing time against cost is more important than at long distances. For conventional aircraft, the bottom range of effectiveness against competition is probably around 200 to 250 miles, but STOL may make air more competitive at even shorter distances at a premium cost. Market reaction to STOL on this point of price has not been tested.

Air appears to be the commercial mode with the greatest potential for improvement from technical change and improvement in productive efficiency. It also has great flexibility in terms of use of vehicles and changes in vehicle size. In Canada, it offers the most balanced coverage of any mode in that it provides a combination of national carrier and regional carrier coverage.

It is still a relatively new industry with a background of glamour that lingers. Because of the way it grew, it built high passenger service standards. It has by a substantial margin the largest role in commercial passenger movement.

Its higher profile has led to public criticism and public pressure in circumstances which may also exist in other modes but do not bring forth the same degree of response; airport curfews which have imposed economic handicaps upon both airline economic efficiency and airport economic efficiency are an example.

The opportunity of the airlines to achieve cost savings which can be reflected in fares, through changes in service standards which do not affect the actual elapsed time, safety or reliability has to be balanced against this high profile and higher degree of expectation that the public has come to associate with this mode. Nevertheless, higher volumes, a more comprehensive approach to mass transportation and relatively lower costs are the trend, not just to be desired but to be expected within this mode if it is to serve the public best. This will bring some changes in terms of what are normally known as comfort and satisfaction standards.

## RAIL

The rail mode is best suited to operations over the short to medium distances where the bus is also most effective although its costs are higher than those of the bus. Like the bus, its long-haul potential is limited. Technical improvement is possible to a limited degree -- more than in the case of the motor coach. Unless substantially subsidized, its role will be limited at the most to a few high density inter-city situations which can support the larger units of a train. Its characteristics make it most suitable for use in these situations and this is where improved rail service should be encouraged as part of any total rationalization of passenger-rail.

It suffers from some special constraints relating to infrastructure (rail-bed) which do not affect other modes. The passenger train has to use a railway track that is primarily used to move freight and that has physical standards and limitations that prevent anything more than very modest improvements in average speeds even though the train itself may be capable of achieving higher speeds.

The Canadian rail system is basically a freight system, unlike the European railways which primarily are passenger-movers with freight secondary. Rail freight movement is essential to the Canadian economy. On much of the Canadian railway roadbed, the excess capacity for train movement which was originally built into the system has largely been used up or is moving to full use. There is a combination of real and potential conflict between the freight and the passenger train which would hamper any major expansion in passenger train frequency unless freight is to be sacrificed.

Any freight transportation which requires new rail lines to be built would ease the situation. While it cannot be said that existing passenger trains are seriously handicapping freight train movement, substantial passenger expansion could do this; and as time passes even the time-sequence now occupied by passenger trains could be utilized by freight trains.

In the high density corridor between Windsor and Quebec, there is for the moment more parallel line capacity than elsewhere and this is the one area where rail passenger density, present and potential, seems great enough to support some self-sufficient passenger-rail activity and improved passenger-rail service.

As for roadbeds and speeds, two problems exist. First, the nature of curves and their elevations place limitations on speed. Second, "slow-down" areas, required by the existence of level crossings or urban built-up situations, and imposed by the government regulatory agency, heavily cut down average speed attainable regardless of the potential speed of the train itself. While not important for minor speed improvement, major overall speed improvement into the 100 mph average would require costly roadbed improvement. While the degree of these expenditures would vary according to the route involved and the objective of the programme, full improvement to eliminate difficulties would be large enough to influence rate structures materially (unless additional subsidies are provided). However, even with limited improvements some better performance in the corridor should be possible.

## MOTOR COACH

The motor coach, inexpensive and flexible, has not achieved its full potential as yet. Statistics Canada recognizes 156 scheduled inter-city and rural carriers with revenues in 1972 of \$111 million. Of these, 11 carriers account for 84% of the total and the next 7, another 7 1/2%. Thus a relatively few large carriers make up over 90% of the industry.

Regional characteristics have been mentioned. Each of the Atlantic Provinces has one major carrier. Voyageur dominates Quebec with services into northern Ontario and its related company Voyageur Colonial is the principal carrier in eastern Ontario. Gray Coach provides major operation in the balance of southern Ontario with extensions to the north although Eastern Greyhound has a southwestern Ontario network which only to a minor degree overlaps Gray Coach. Ontario Northland Railway has a bus subsidiary in northern Ontario. Manitoba has two companies that do not duplicate each other's routes. Coachways, owned by Greyhound, serves Alberta and parts of British Columbia and the Yukon. Greyhound of Canada, the largest single carrier has a non-competitive network from Vancouver through to northern Ontario and, when taken in connection with Eastern Greyhound and Coachways, is the closest to a national carrier. The Greyhound group accounts for 25% of total revenue, and the Voyageur group (owned by Power Corporation) control about the same volume as Greyhound. These two groups, Greyhound and Voyageur, represent just over 50% of the industry. If Gray Coach, based in Toronto, is added, then the three earn about 65% of the industry total. The remaining companies are much smaller.

The lack of a fully national carrier and the fairly large number of companies have been impeded through service. Some companies have participated in equipment interchanges that permit a through bus to operate over the route system of two carriers but this is by no means a universal practice. Through service from Ontario to western Canada exists, but a bus traveller from Toronto to Halifax, has to change buses and travel on four different services.

The fact that jurisdiction is divided between the ten provinces and that the federal government has not implemented its authority over inter-provincial bus movement, probably has slowed national growth of the motor coach industry. It has not achieved the same national carrier basis as the air industry, for example. It has not been dealt with in federal planning on the same basis as the other modes in the evolution of transportation policy.

It may in part be a result of this that some (but not all) of the other constraints have emerged. The companies are smaller and more numerous. There are some indications that provincial jurisdictions may at times have given them lower priority of treatment compared to the private auto. Canadian Transport Commission analysis suggests that of the three road vehicle types, bus, truck, auto, the bus mode appears to be carrying full costs of infrastructure whereas the auto and truck are not (or alternatively a relatively heavier load of charges has been placed on the bus compared to the others).

There is a marketing problem related to social and public image and acceptance. Buses can be comfortable with full on-board amenities (although many in Canada used by the smaller companies are of older type and are

markedly less comfortable). Bus terminals tend to be more crowded and less attractive than in air and rail modes (but in consequence cheaper to operate). The businessman in many cases appears to have a dislike of bus use compared to other modes (also true to some extent for higher income travellers generally), -- part of an actual reflection of service standards and perhaps part of class consciousness which is reflected in the use of other modes even where the bus can be competitive in terms of time and cheapest in terms of cost.

These are all market-consciousness constraints which have to be overcome by the industry itself. A better service image will not be achieved overnight, -- as witness the failure of a special motor-coach experiment in a special businessman's inter-city bus between Calgary and Edmonton within the last few years. However, the bus has sufficiently great advantages over other modes to enable it to improve those service aspects which are connected with this matter of image, by a substantial degree and still remain the least expensive common carrier. The change, as in most areas of social image, will be gradual and more than one experiment will be needed to achieve it.

In summary, the bus is the lowest cost method of common carriage with great flexibility in terms of unit size and use. It is best suited for short to medium haul movement and, in this range, the only commercial mode suited to low density situations but it can also satisfy high density requirements in most situations in Canada. In terms of infrastructure capacity, no particular problems confront it. In the sense that governments have it in their power to give it greater priority treatment in relation to road use, it has few limitations in terms of infrastructure now available.

It is also the obvious mode on which to rely for movement of lower-priced traffic in cases where rail passenger service may disappear. It requires consideration in federal planning and more active federal interest and encouragement.

#### THE CASE FOR NATIONAL CARRIERS

Review of the different structures of the three modes has suggested that in total a mode can offer better national service and better serve both the public and any special policy requirements of government if national carrier status has been achieved within that mode.

For example, the national carrier, regardless of ownership, can more easily develop total through service where it is required; and will be more likely to offer equity of treatment in rate structures on a national basis, without major regional variations. It will be able to achieve economies of scale and represents a more effective total instrument for governmental use when needed.

This is not a criticism of regional services. These become valuable adjuncts to any national service structure and are part of the total structure of any mode.

It is suggested that it would be a desirable objective for government to seek to ensure that each mode achieves within it some national carrier coverage.

RECOMMENDATIONS

1. Within the framework of service now provided by all commercial modes the motor-coach needs to be given more active consideration in federal planning.
2. Achievement and maintenance of a national carrier structure by mode represents a desirable objective.

SECTION XV: PASSENGER FARES

A. GENERAL COMMENT

All the passenger modes have both standard and discount fares. In each mode the standard fare is used as the basis for constructing various discount fares although relationships are not always exactly comparable. The difference between the standard fare per mile and the total cost per mile does not represent profit. Revenues earned come from a combination of standard fares, and various discount fares; these have to be combined to find the average which is earned per passenger-mile. To take a hypothetical case, total average cost per passenger-mile might be 3 cents, standard fare might be 4 cents, but the average fare or "yield" might only be  $3\frac{1}{4}$  cents.

However, since the standard fare is the basis from which all other fare calculations start, it represents a reasonable basis for comparison of modes.

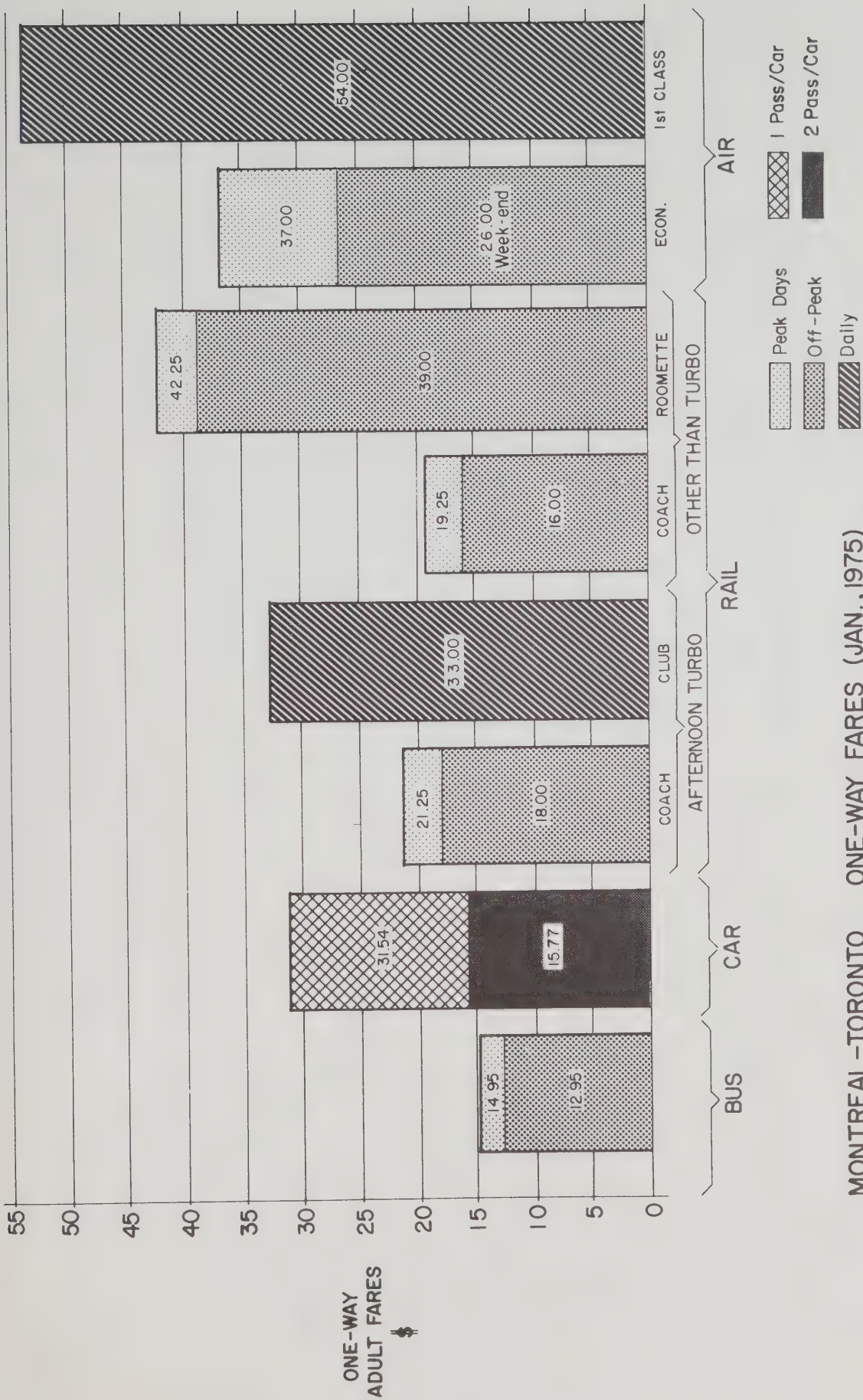
All modes charge according to distance. In the earlier review of costs, the point was made that costs per mile generally become cheaper with distance. This is reflected in fares in all modes. The farther the passenger travels, the cheaper his fare per mile.

In the air mode, at short ranges below 500 miles, fares taper heavily by distance. The most recent Air Canada proposals for a new fare structure range from around 7 cents for transcontinental distances to 11 cents at 500 miles, 13 cents at 300 miles and still higher at shorter ranges. Bus fares have less of a taper, as do standard rail fares, while rail fares with sleeping accommodation added show the greater taper to be found in air fares.

The airlines for long have acknowledged that their short-haul fares, while higher than long-haul rates, did not reflect total allocated costs over short distances. The changes introduced in the last few years including the most recent one referred to above, suggest that short-haul air fares may be moving much closer to actual short-haul costs. The cost variation between short and long-haul movement is greatest in the air mode. Not enough is known about cost variations by distance to judge whether the present fare taper in rail and bus modes reflects the real cost taper in those modes and whether given the most recent changes in air fares, the modes are now in reasonable balance in this respect. Some question as to the rail taper exists and further examination of actual costs in relation to distance in all modes should be undertaken although under a regime of self-sufficiency and no subsidy, reliance may be placed on carrier initiative to deal with these situations within the limits of the policy on fares suggested in the later section. Figure XV-1 shows the various fares in effect between Montreal and Toronto in January, 1975. Figure XV-2 gives a more generalized description of fares over distance for each mode.

b. AIR FARES

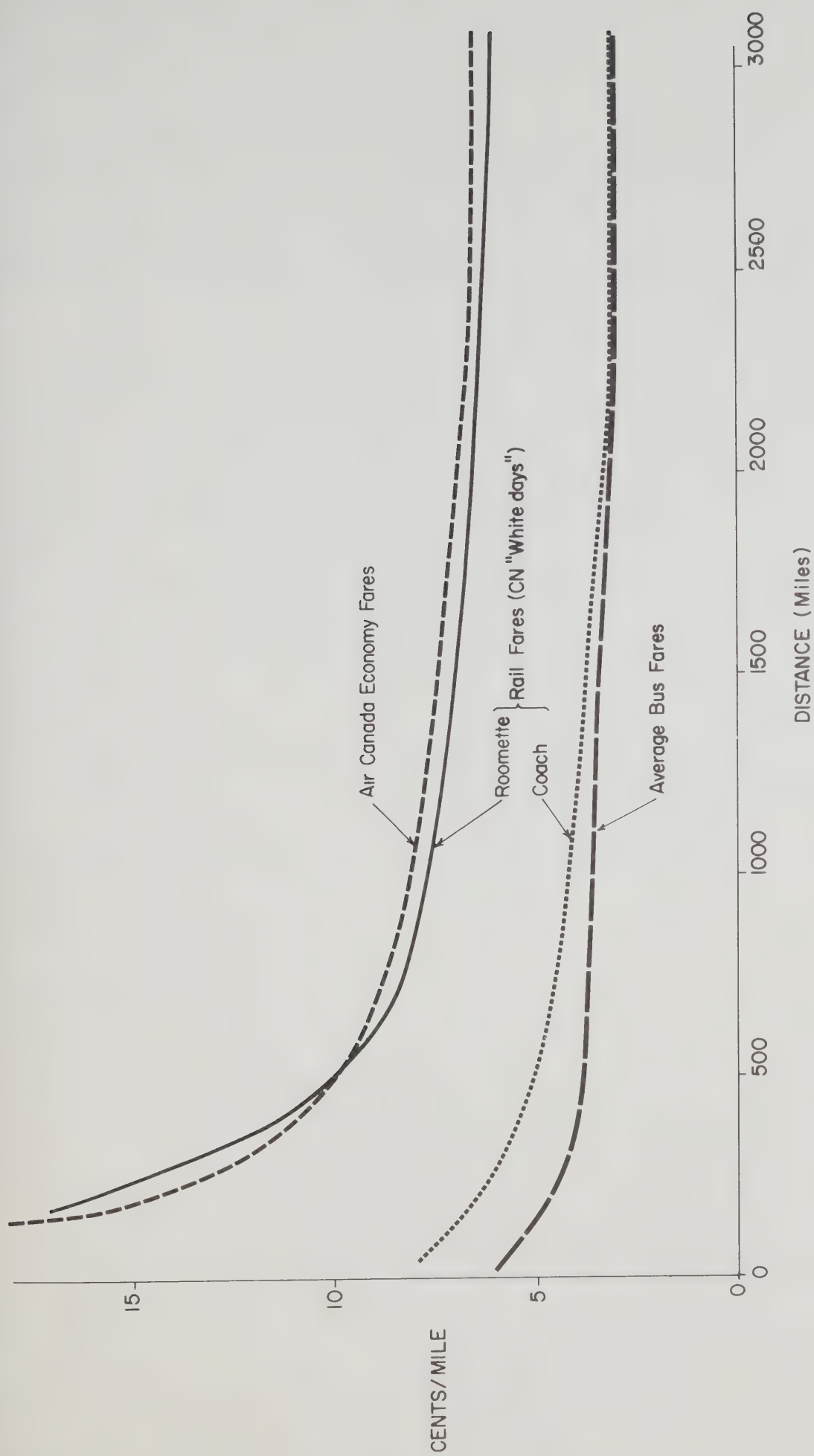
The C.T.C. study on this subject suggests that short-haul air fares are  $2\frac{1}{2}$  to  $3\frac{1}{4}$  times higher than bus fares and between 2 and  $2\frac{1}{2}$  times higher than rail; obviously serving those passengers, business and non-business, who put a premium on time. On long-haul between air and bus, the fare difference is not as great (air is about twice as high), with air and rail even closer together. If rail sleeping accommodation is included, air is equal to or cheaper than rail.



MONTREAL-TORONTO ONE-WAY FARES (JAN., 1975)

xv-1





## COMPARATIVE MODAL FARES BY DISTANCE



Air Canada, in view of its more complete national structure, sets the pace for air fares in most of Canada. Only on the regional and CP Air monopoly routes (chiefly northern), is the Air Canada influence absent. Here, for a variety of reasons, fares are generally higher per passenger mile.

While a regional carrier or CP Air may initiate action to lower a rate, this has been a rare occurrence (and usually in relation to some special or discount fare). Most major changes have come from Air Canada. Equally, mainline fares generally cannot go up unless Air Canada increases its fares. Given the marginal profit position among air carriers, the result has been that Air Canada has acted as the "brake" on fare increases.

As indicated, the actual levels of standard air fares on the mainline domestic services run from about 7 cents a passenger mile at long-haul to well over 20 cents on short-haul. (The PWA \$22.00 fare on its air coach on the 154 mile route between Calgary and Edmonton works out over 15 cents a mile). Air fares have tended to climb more steadily and somewhat more realistically in relation to costs, than rail passenger fares in recent years.

Air Canada has supplied information which indicates a logical, fully-structured plan for fare construction that provides equality across Canada; the same fare, the same distance, no matter what route. Information is not available on formulae if any, used by other carriers, but their fare structures all reflect considerable cost-distance taper and generally match the Air Canada level. Where carriers are not in competition on the main east-west structure, (the northern routes of CP Air and the regionals), fares are generally higher and less consistency in equalization of fares by

distance exists. Several 1974 fares on routes of one regional, all in the broad 500 mile category and on so-called "monopoly" routes, vary from just under 10 cents a mile to just over 15 cents a mile depending on route. Variations of this type can be found in the structures of all the regional carriers.

#### SUMMARY

On the mainline structure a basis of equal fare for equal distance has been set by Air Canada. The Air Canada levels are followed by CP Air and the regional carriers where they compete. Elsewhere, exact equalization by distance does not exist although there is a broad framework of equalization with a cost-distance taper. Generally, higher levels prevail with less equalization on the northern and private "monopoly" routes.

#### C. RAIL FARES

The railways have apparently not applied an exact formula in the manner that has been followed by Air Canada (and most large North American air carriers). They have used a general cost-distance taper without exact equalization and with some grouping of points and flexible market-pricing. On longer-hauls they have, including extra sleeping accommodation charges, tried to be competitive with air; at shorter-haul, without these charges, with bus.

Based on data derived from the rail passenger fare working paper, CNR fares generally are slightly under the CPR level and the CPR has not gone quite as far as CNR in terms of special discounts. CPR also charges a little more for sleeping accommodation. At the medium to short range,

the standard CNR fare runs from 5 cents a mile to 6 cents a mile. As distance increases over the 500 to 600 mile medium range, it falls to about 3 3/4 cents at full transcontinental distance from central Canada to Vancouver.

In addition, sleeping accommodation can cost from 2 cents to 3 cents a mile for the cheapest type and from 10 cents or even 20 cents for more expensive accommodation. Within these broad variations, the rate decreases per mile with distance but as a generalization, rail fare with sleeping accommodation move into and above the air fare class. It does not compete except for those who can afford air travel but want the experience of a ground journey by rail. For those who forego sleeping accommodation and accept the discomfort of a longer journey in terms of hours in order to get a cheaper fare, then the bus can be a strong competitor since it operates at a less expensive fare level, (e.g., Toronto-Vancouver air \$143.00, rail \$103.00 to \$116.00 without berth, bus \$73.00 January 1975).

The point has already been made that in looking at fares in relation to costs, what a mode receives is not the standard fare although this represents a reasonable basis for comparisons between modes. All modes have discount fares and what is finally received in revenues is a "yield" per passenger mile somewhere between the standard and discount fare. In assuming a rate increase to cover a given cost figure, the standard fare must be set at a level which takes into account the fact that yield actually received will be lower than the standard fare.

Viewed from this point of view, the short-haul standard fare structure of 5 cents to 6 cents a mile on CNR on its highest density operations, were it to cover current losses, might have to go up to 8 cents or 9 cents a mile

in some cases, to 11 or 12 cents a mile in other cases to cover current costs. This would be below air but well above bus costs and fares. On the transcontinental, the level would apparently have to go up to a range between 11 and 15 cents to cover present losses -- putting it well above air fares.

As a matter of historical interest, the rail passenger fare level until the most recent (1975) increase was not only well below costs but lower than the 1961 fare level. Both railways, in particular CN, introduced substantial fare reductions in 1964 to try and build up business. Fare levels increased very little in the subsequent ten years. This improved traffic volume only temporarily, although results might have been even worse otherwise. Taking the '64 levels as a base, CN long-haul fares had gone up only 18% by 1969 and short-haul only 11%. The most recent larger increases (1975) change these figures substantially.

CPR fares followed the same pattern but with less extreme swings. It is impossible to tell what effect the recent increases in rail fares will have on losses, until it can be seen whether traffic stays with the railways or moves to lower fare bus travel in consequence; and what the full effect of rising costs will be. The railways themselves have argued before the C.T.C., that the recent fare increases are primarily to keep abreast of rising costs.

As will be seen in a later section, rail passenger fares are very heavily subsidized to a degree above the indirect subsidy in other modes, and to a degree which means fares have been covering barely half the costs of service.

D. MOTOR COACH FARES

Bus fares are related to rail fares and leave the impression that a prime objective is to keep somewhat below rail rates. The larger bus companies which serve the same cities as the railways have introduced the same type of off-peak discount and promotional fares as the CNR or CPR. Buses have, however, retained the round-trip discount discarded in other modes; and have added advantage when round-trip fares are compared with rail (except in connection with the new low four-day round-trip discount fare introduced recently by the CNR).

There is a motor coach disadvantage on through fares compared to other modes. This results from the segmentation of the bus industry. When two or three different company franchises are involved, the through fare is decided by adding "local" fares to the through fares between a series of inter-regional points which have been agreed to by the industry. This results in a combination of fares in many cases, to get a through rate. The resultant combinations do not reflect the extent of decrease in rate to be found on through long-haul. A low rate associated with cost-distance taper can, however, be found on those longer routes where there is through direct service.

Thus, the division of the industry has meant that some long-haul routes where through service exists have very low rates but if combinations using several carriers and points other than the main inter-regional points are involved, the total fare may be higher per mile than on a hypothetical through bus route of equivalent distance.

Bus fares while generally equalized within each major company on a base broadly related to distance, differ somewhat from company to company, reflecting the differing regional costs of each company.

Because, unlike the air and rail modes, there are no "national" carriers, a national average fare can be misleading. Most bus journeys are short-haul. Examining fares up to 500 miles, the lowest bus fares are available on the Prairies, followed by the Pacific region, while the Maritimes have the highest fares. The central regions fall between. The national average tends to be close to that of the central regions. These are broad generalizations and exceptions can be found in smaller operations.

The cost-distance taper also varies from company to company. It is greatest in Maritime rates. This means that short-haul fares there compared to the national average are relatively higher than long-haul. This could result from less complete cost allocation in rate-making compared, for example, to the air mode but again is primarily a reflection of the segmentation of the industry.

The national average indicates that bus fares, in the 100 to 500 mile range, taper from about 5 cents a passenger mile down to about 4 cents a mile, with fares below 100 miles climbing much higher up to or well above 10 cents at 25 mile distances. The western average, as indicated, is lower than this; the Maritime average is higher.

Over 500 miles, the regional differences in through rates tend to disappear, with the average at 1000 miles being 3.84 cents and at 300 miles 3.19 cents. Comparing this with a CNR average of 5 cents to 6 cents standard fare on shorter-hauls dropping to 3 3/4 cents on the transcontinental route confirms the initial statement that bus fares tend to remain below rail fares. The principal difference is that the bus fares cover costs.

E. THE FUTURE TREND IN PASSENGER RATES

For some three decades productivity improvements resulting from technological improvements of a major nature have helped hold transportation rates down in relation to changing costs in the economy. The cost of transportation has not increased nearly as rapidly as other costs. This was most apparent in the air mode but existed to some extent in road and rail as well.

While some further technological improvement can be expected, particularly in air, it is not likely in any mode to have the same effect on costs, as in the past. When this is combined with the effect of further increases in fuel prices, the likelihood of a higher plateau for interest rates in future compared to the past, and indications of a generally more rapid increase in costs in all sectors, the likely result will be continuing increases in transportation costs much greater than that to which the public has been accustomed since World War II.

SECTION XVI: A POLICY FOR PASSENGER PRICING

Pricing of passenger services usually reflects three factors:

1. the value of the service to the user;
2. the position as regards competition;
3. the cost of providing service.

These philosophies seldom operate in a "pure" sense; most cases require that they be blended to meet particular circumstances but the degree of emphasis on each has a great deal to do with the resultant rates.

Normally, where competition exists, prices are within the limits of economic common-sense in relation to cost set to meet or compare with the competition. If no competition exists, prices may be set as high as the operator can reasonably go in terms of value of service, unless some formula related to cost holds them down. The "higher" air fares on northern monopoly routes as compared to the competitive trans-continental area probably reflect this type of situation. So does the inter-modal situation described elsewhere. Bus fares are set with rail rates in mind. Rail rates are set with bus in mind on shorter distances and air on longer distances. Air, with less competitive impact from other modes, while influenced by internal competition has tended to evolve on cost of service - the system of charging the same fare by distance everywhere in Canada.

Value of service reflects the greatest flexibility and in competitive situations can provide the cheapest rate; or alternatively in non-competitive, the most expensive. This approach is most likely to create public complaint unless clearly related to a competitive situation,

because the variations are not fully related to cost and may seem to be discriminatory. It does, however, provide greater stimulus to low fares where competition is effective and greater freedom for management to develop business in total.

Pricing related to cost of service can be more easily understood and can contain varying degrees of equalization or "equity". The most complete was the system averaging with no cost-distance taper originally followed by Air Canada and most U.S. Airlines. Followed too rigidly it can force fares up and prevent effective competition. Most systems contain some element of cross-subsidization - more expensive "monopoly" traffic may in some cases subsidize cheaper "competitive" traffic where a carrier has to meet a competitor's rate; or the long-haul passenger may subsidize short-haul if the short-haul rate does not fully reflect the short-haul costs. The difficulty in rate rules that are entirely cost-oriented is the decision on what type of costs to use - system average, regional averages, distance factors, degree of margin versus overhead, and their inflexibility. These items while less understood by the public are in fact more complicated and controversial than apparent "discriminations" in value of service market pricing differences.

The present extent of competition is described elsewhere as well as the rate philosophies of the modes. The truly non-competitive situations are those bus routes where there is no competitive mode and the monopoly air routes, particularly in the North. The few remaining Air Canada monopoly routes are protected by the Air Canada policy of standard system fares. The bus companies with system rates use a similar approach which offers rate equity on other monopoly bus routes of large concerns.

It would be possible to evolve a formula related to fares based on exact route-costing (although public dispute as to the formula would probably be prolonged or incessant), and force each carrier within its own structure to follow it regardless of competitive relationships. This would, at the same time, tend to keep prices up and prevent the lower rates that emerge when carriers are permitted to function, subject to limited constraints, only in a market-oriented atmosphere with pricing reflecting the market conditions.

On the other hand, if carriers are to have reasonable freedom to respond to market and competitive conditions, then it is necessary to ensure that the carriers maintain independence of action rather than drifting into collusive practices. One of the problems of any regulated industry is that prices tend to stabilize between competitors and competitive price innovation although not eliminated, can be dampened.

Competitive innovation in the bus industry appears to have been limited largely to following railway leads (with a few exceptions). CN and CP Rail have not been too far apart in their approach to fares although not identical and have as noted set their rates with one eye on the bus at short distances and the other on air at long distances. Air Canada sets the pace in air, with problems of low profitability and possibly limitations of licenses restraining CP Air from major innovation, and the regionals in the same boat because of higher average costs. Air Canada may have been less innovative than desirable merely because of a somewhat difficult relationship with domestic competitors and desire to avoid the criticism that they would launch if Air Canada took a substantially more vigorous competitive approach to rates, regardless of the consequences for regional carriers.

These facts suggest a possible need for greater emphasis by all regulatory agencies on independence of action in fare-setting by carriers as distinct from the traditional "stabilized" approach; and the consequence that on the other side of the coin, rate formulation by the carriers in this atmosphere should be free from detailed control except in situations of monopoly.

Given the situation described, it appears that the principle of comparable cost which appears implicitly in the N.T. Act has to be re-defined for use in the passenger field. Costs are not comparable between modes nor are they comparable between regional carriers in a single mode because of regional variations. There are some broad similarities but current regional variations, whether bus or air are significant. Only in the case of a national carrier does a reasonable yardstick emerge. National carriers can be compared with each other (assuming similar route patterns) or with U.S. carriers (as is provided in the Air Canada Act), but even here only in a broad sense. What can be found as a basis for comparability is the cost (either averaged in total per mile, or varied according to distance taper) for any one carrier's system.

The desired approach to rate-making and rate-control can be developed only within the context of government decision as to whether all commercial passenger modes are to be treated alike in terms of assistance and whether the government in this context accepts an objective of full commercial self-sufficiency. A policy of unequal subsidy obviously leads to unequal competition which can only be offset by extremely tight and comprehensive rate control; this would probably be so complicated as to be impossible of achievement.

A policy which mixes types of subsidies even if striving for equality of treatment of the modes also leads to great difficulty; again almost impossible in terms of solution short of very complicated rate control. This is the present situation where direct subsidies in one mode are combined with indirect subsidies in another. The problems in measuring the balance and relating this to a rate control system are obvious.

Worst of all is the subsidy which guarantees payment of all or most of a loss as in the current legislation regarding rail passenger service. This encourages a carrier to embark on uneconomic courses; can reduce incentives for efficiency; and can most easily lead to distortions in competitive relationships since the carrier has a type of economic guarantee that makes it possible to move against a competitor on a completely unequal basis.

If subsidy has to exist it should avoid the loss-guarantee approach; and should, if possible, be approached on the same basis for all modes, - i.e., avoid combinations of direct and indirect assistance. Otherwise reasonable rate-making and enforcement thereof becomes much more complicated.

For the purposes of these recommendations, it has been assumed that the government will seek equitable treatment of all modes either by the acceptance of the principle of full commercial self-sufficiency or if some general assistance is accepted, equitable treatment of all modes, not only to the same degree but if possible using the same type of approach.

It has also been assumed that to achieve the maximum benefit to the user that can result from the working of commercial and competitive forces, the approach should be to start with freedom of action in rate-making for the carrier and determine what limitations need to be imposed rather than

starting with the need for complete control and determining what exceptions are possible. It has also been the intent to maintain and improve the equity of passenger treatment that now exists in the present approach to equal fares for equal distances; and ensure reasonable protection for the user in genuine monopoly systems.

To avoid the necessity of detailed and slow processes of approval, the approach has also been related to the idea of establishment of a formula for carriers to follow.

#### RECOMMENDATIONS

##### A. Principles

1. Reliance on market pricing in circumstances where effective competitive relationships, whether inter-modal or intra-modal, exist; freedom of action to set fares in these conditions subject only to tariff filing.
2. Broad use of standard system charges with a cost-distance taper as a means of providing protection and stability in non-competitive conditions; each carrier to use this approach on its own system.
3. Broad requirement that discount fares be constructed in terms of a general relationship to standard fares.
4. Protection of the user through process of public examination where necessary to ensure particular rates or tariffs comply with the foregoing principles.
5. Judgement based on comparable costs other than the carriers' own system costs to be a residual factor of assessment in any investigation of monopoly rates where reasonable comparable rates can be established.

B. Methods

1. The regulatory authority could establish a general formula with lower and upper limits using the cost-distance taper approach. The formula should be flexible enough to recognize variations in types of service within a mode but should also place some limit on amount of cross-subsidization between short and long routes in a system.
2. Carriers could be required to file fares in accordance with the formulae. Filing should be accepted providing they comply, and also subject to freedom to set rates to meet competitive situations.
3. In cases of public complaint in regard to monopoly situations, carrier complaint in competitive situations, or if dissatisfied on its own account the regulatory authority should investigate using the principles described above, and also the general principles of the total transportation policy and if necessary postpone or disallow.
4. The regulatory authority should ensure that collusive activity does not take place in the matter of domestic tariff filings in competitive situations.

SECTION XVII: THE OBJECTIVE OF COMMERCIAL SELF-SUFFICIENCY

A. COST RECOVERY PROSPECTS

The principal issue involved is whether government should adopt a theory of economic self-sufficiency with regard to passenger transportation. This implies a programme of full cost recovery through taxes or user charges in connection with government expenditures on support services provided to transportation (commonly described as infrastructure); and elimination of direct subsidies except in the special situations mentioned later.

The National Transportation Act adheres to this theory in loose terms but by using the phrase "so far as practicable" sets this as a desirable objective but not necessarily achievable.

A situation in which all passengers are, in fact, providing the full cost of their transportation obviously has many advantages. It removes heavy demands on the general taxpayer to support particular segments of the public. It creates a situation which puts each mode in a fair and equal relationship and prevents costly distortions in use, allowing each mode to function on the basis of its own ability. It makes total capital financing easier because standard criteria can be applied; and it should result in reductions in total capital demand in this sector. It also removes a source of complaint from either a particular strata of society or from regions about discrimination resulting from unequal treatment of modes or carriers. Finally, in cases of special government financial intervention in a transportation matter to satisfy a requirement arising from one of its priorities in another field, it makes judgement as to the best approach easier because all modes are on an equal footing.

Subsidies to carriers or users have to be placed in the same category as indirect subsidies through provision of infrastructure at no cost or less than cost, in order to achieve a fair comparison.

Major differences of opinion have always arisen in regard to:

- (1) Costs to be recovered
- (2) Costs to be apportioned between users
- (3) Indirect revenues (e.g., fuel taxes), to be taken into account.

In the case of the railways, a straightforward approach is possible using the passenger subsidy programme as a base. This is the principal cost assumed by government in the rail-passenger field, although there are regulatory expenses connected with the Ministry and the C.T.C.

In the case of the road mode, difficulty arises in apportionment of costs between the private auto, the truck and the bus; and, in the latter two categories, between private and common carrier vehicles. Some indications can be derived from licence data, average vehicle mileages and fuel taxes collected. On the expense side, the questions to be considered are what costs should be considered in relation to road construction and maintenance - for example, Provincial Government Road Safety Organizations, etc. Provincial fuel taxes are the prime source of revenue.

In the air mode, similar but more difficult issues arise. Airport costs are identifiable but part of the cost for aviation relates to other support services which exist in other modes but are more expensive in the air mode. Weather services are a national service but aviation receives special attention. How much of this service should be charged to the user?

Safety services, construction administration, technical regulation or airworthiness, etc., all account for substantial costs, -relatively greater in air than in other modes. Should they be charged fully or in part against the user in aviation - and if so, their equivalents in other modes?

There are controversial issues regarding allocation of user charges. A commercial aircraft with 200 passengers may place more burden on a runway and a terminal building than a private aircraft carrying 4 or 5 people - but the two aircraft can create equal workload in terms of air traffic control, use of electronic ground aids, and weather service. Should costs of the latter type be allocated realistically against aircraft, not against individual passengers and if so, can private aviation stand the level of costs?

The issue of revenues to be taken into consideration emerges, although not on a large scale. Most provincial governments collect special taxes on aviation fuel and some on railway locomotive fuel. These modes are supported by the federal government. Should this provincial income be offset against revenue required in these modes?

These questions indicate the complexities of the issues to be resolved. However, broadly indicative figures can be used for the purpose of government decision in principle; more detailed analysis would then be required to establish a pattern for implementation.

Two other important principles need to be considered. The carriers can provide capacity by vehicle units of small to large size with buses having the greatest flexibility at the smaller end of the scale, air having the greatest flexibility in total varying sizes of vehicle, and rail the least flexibility requiring a fairly large minimum component to start with.

Infrastructure or ground capacity, whether a road, rail-bed, airport or a system such as air traffic control is provided in larger increments designed to last for a substantial period of years during which vehicular use will grow until capacity use is achieved. It would seem unreasonable to expect that users at the outset when utilization is low, should pay full user costs. It would be reasonable to expect that whatever level of recovery is decided upon by government should be achieved as the facility moves toward full capacity - with, as upper ranges of capacity are reached, profits available to offset earlier periods of loss at lower capacity (the situation already achieved at Toronto and Montreal Airports).

Second, facilities serve different objectives. A simple but logical concept for dealing with this situation has been developed within the broader work of the transportation task force, that of the facility serving a mature transportation system in a mature region and a facility primarily serving a developmental requirement where economic maturity will take some years to achieve. The mature situation can be measured in terms of self-sufficiency achievable in a short time frame or immediately; the developmental situation recognizes the need for assistance over a longer period.

To give a few examples, roads in northern British Columbia or Alberta could be considered developmental while a road structure between Vancouver and Kamloops, or between Calgary and Edmonton relate to mature situations. The airport at Terrace, B.C., with revenues of \$82,000.00 and expenditures of \$240,000.00 is obviously in a developmental and limited use category and would not fall in the mature category. Windsor with revenues of \$463,000.00 and expenditures of \$489,000.00 is reasonably mature and should achieve self-sufficiency.

Obviously, there will be many grey areas in attempting to take these two principles into consideration in developing principles for cost recovery; but they should be valuable in dealing with issues relating to major new infrastructure investment requirements. With these principles in the background, an attempt has been made to assess the present situation as regards economic self-sufficiency in the various passenger modes.

Work by the Canadian Transport Commission using 1972 data has suggested that, in terms of total outlay that year, the rail passenger was subsidized about 5 cents a passenger-mile, the air passenger 2 cents, the private auto just over  $\frac{1}{2}$  cent a passenger-mile, and the bus passenger very little - if at all. (See Table XVII-I). Cost assumptions could not be completely consistent because of lack of data; provincial fuel taxes (already mentioned), were not included in revenue calculations for air or rail. Commercial aviation was charged with the full deficit in that mode whereas some portion should be borne by general aviation. Nevertheless, the figures can be accepted as broadly indicative of magnitudes and relativity. Further support data is being developed.

Since the lowest income group are the greatest users of the bus and this mode is virtually paying its way, it is worth noting in relation to any concept of equity that the lowest income group is bearing the largest share of total costs and the higher income groups, users of air and rail, are bearing less than their share.

A deficit of .063 cents a passenger-mile applied to the private auto is not too large an element to overcome over a period of years if governments decide to make this mode self-sustaining. With average occupancy of the auto at  $1\frac{1}{2}$  persons and mileage at 15 miles to the gallon this would represent 13 cents a gallon - more if higher occupancy or

TABLE XVII-I

ESTIMATED SUBSIDIES 1972

|                                       | <u>AIR</u> | <u>RAIL</u> | <u>ROAD</u> |
|---------------------------------------|------------|-------------|-------------|
| Subsidy per Passenger<br>(dollars)    | 11.87      | 14.31       |             |
| Subsidy per Passenger<br>Mile (cents) | 2.01       | 4.98        | 0.63        |

greater mileage per gallon is achieved - but less if volume in total grows. Some portion of deficit too would have to be charged against vehicles other than private autos, such as trucks, private and commercial if it is found they are not paying their share of fully allocated costs. Roughly, it may be that a range of 10 cents to 20 cents a gallon is the factor being looked at - a large amount in a short time frame but not in terms of achievement over a five or ten year period. Again, these figures are indicative only at this stage. Full consultation and co-ordination with and between provinces would be needed.

The C.T.C. work suggests an indirect subsidy of two cents a passenger mile in the air mode in 1972. This study did not attempt to allocate any cost against non-commercial aviation, nor did it attempt to use the principles suggested above regarding developmental airports and degree of use of capacity. Since 1972, an airport tax has been introduced and revenues have grown in consequence (as have costs). As a broad indicative measurement, it has been assumed that two cents a passenger-mile figure might be required to cover full costs.

Considered against the present standard air fare structure with traffic continuing to grow and given the fare increases that will be required in this mode in coming years, absorption of a cost figure of this sort into the fare structure over a five to ten year period does not appear unreasonable.

If government decides to move in this direction, a strong case can be made for placing those airports and air systems which are to be measured by the yardstick of self-sufficiency, in a corporate authority in the interests of efficiency and measurement of results. The number of airports might run anywhere from the largest 12 to the largest 24 airports but, in

either case, would represent the largest portion of total costs. Considerable further work would be needed to develop a satisfactory and reasonable approach. A special section outlining some major implications follows.

Rail passenger service is dealt with at length in the next sections and recommendations, consistent with those in this section are made. In the rail mode, the achievement of self-sufficiency through elimination of the heavy and wasteful passenger subsidy programme can be achieved through substantial revisions in the nature of rail passenger services. Absorption of the present average passenger mile subsidy in the fare structure would not be possible in many cases but on the higher density routes, should be feasible - particularly if account is taken of increases in short-haul air fares and an improved rail service is provided in these situations.

A secondary issue to be considered in cost recovery is the treatment to be accorded provincial fuel taxes imposed on travel modes not under their jurisdiction. The principal argument for the provincial fuel tax on road users has been collection of funds to cover road construction and associated costs. Most provinces have now imposed taxes on aviation fuel and some on rail locomotive fuel. The argument that the former is justified because of road requirements associated with airports is not logical, if one uses the approach that taxes on fuel used by road vehicles are to cover road costs. The case for taxes on rail fuel is harder to comprehend. It is suggested that this merits discussion with provinces and that, meanwhile, as already noted that this revenue should be considered a credit against federal costs associated with these modes. The amounts, although not large, do run into several millions as shown in Table XVII-2.

TABLE XVII-2

SUMMARY STATEMENT OF PROVINCIAL FUEL TAX REVENUES PAID BY

MODE: 1972

(Dollars)

| <u>Provinces</u> | <u>Rail</u> <sup>1</sup> | <u>Air</u>    | <u>Bus</u> <sup>2</sup> | <u>All Highway</u> <sup>3</sup><br><u>Vehicles</u> |
|------------------|--------------------------|---------------|-------------------------|--|
| CANADA           | 9,797,893                | 15,527,707    | 3,864,878               | 1,167,748,000                                      |
| Nfld.            | Locomotives exempt       | No tax levied |                         | 22,681,000   |
| P.E.I.           | Locomotives exempt       | No tax levied | 295,815                 | 6,182,000  |
| N.S.             | Locomotives exempt       |               |                         | 42,478,000   |
| N.B.             | Locomotives exempt       | 692,693       |                         | 34,673,000   |
| Quebec           | 2,022,266                | 5,276,783     | 969,460                 | 321,222,000  |
| Ontario          | Locomotives exempt       | 4,932,008     | 1,415,043               | 439,119,000  |
| Manitoba         | 2,222,605                | 658,972       |                         | 48,176,000   |
| Sask.            | 1,544,259                | 344,320       | 1,077,253               | 53,203,000   |
| Alta.            | 1,651,395                | 1,562,450     |                         | 85,411,000   |
| B.C.             | 2,347,368                | 2,060,481     | 190,706                 | 109,862,000  |
| NWT              | N/A                      | N/A           | N/A                     | 2,270,000  |
| Yukon            | N/A                      | N/A           | N/A                     | 2,472,000  |

<sup>1</sup> Tax revenues for propulsion of locomotives.

<sup>2</sup> Includes revenue from both diesel and gasoline taxes.

<sup>3</sup> Data based on fiscal year, April 1, 1971 to March 31, 1972.

Statement of motive fuel taxes.

Since any rationalization and improvement, because of problems of public acceptance, would be likely to take several years, the objective of self-sufficiency could be set for planning purposes at this stage with a review of progress in all modes to be set down three to five years after the initiation of the total programme to assess progress and ensure balanced treatment of all modes. A federal interim objective of 50 percent improvement within each mode would be a reasonable three to five year target. The attitude to be taken, if provinces are reluctant to accept a self-sufficiency target for the road mode, would have to be considered in implications for air and rail.

#### RECOMMENDATIONS

1. The principle of self-sufficiency in passenger modes should be accepted and a programme to achieve this over a five to ten year period initiated.
2. In determining realistic programmes of achievement, the commercial carriers should not be required to bear more than their fair share of total costs. Costs associated with non-commercial passenger movement should be apportioned suitably to general users.
3. Facilities and services both existing and required in future, which are recognized and identified at government level as developmental in nature should be treated separately in terms of the total cost recovery programme.

B. RAILWAY PASSENGER SUBSIDIES

Total cost of these subsidies in 1974 will probably exceed \$130 million with total passenger losses reaching \$160 million. If no change is made this latter figure will reach \$400 million by 1980. Analysis of the railway losses and government subsidies paid to support these losses on 1972 rail-passenger services when the subsidies were only 62% of present level reveals costly support of passenger movement as shown in Tables XVII-3 and XVII-4.

The average subsidy per passenger-mile paid by the government for each rail-passenger was about seven times as high as the indirect subsidy borne by the taxpayer for each road-user and twice as high as the indirect subsidy for each air passenger. Described in extreme terms it would be cheaper for the government to buy a bus ticket for each rail-passenger and give it to him free of charge, than to subsidize the rail-passenger traveller as at present; and bus service is available alongside most of the rail routes involved and in the case of many routes, air service as well. On several subsidized rail-passenger routes it would be cheaper to buy the passenger an airline ticket, and give it to him free. Load factors appear to lowest of all commercial modes but even at 100% load factor (unattainable) revenues at present rates would not cover costs.

For example, using 1972 data when losses were lower than they are now and comparing these with 1975 fares, each passenger (C.N. and C.P.) using the transcontinental trains was costing the government and rail companies in loss about sixty-one dollars; the C.N. standard rail fare (no berth) from Toronto to the West Coast, is one hundred and three dollars. The fare plus the loss is one hundred and sixty-four dollars. Air fare is one hundred and forty-three dollars (Jan. 1975). The bus fare is seventy-three dollars.

TABLE XVII-3  
1972

CANADIAN NATIONAL PASSENGER SERVICE LOSSES

|  | LOSS<br>(DOLLARS ) | REVENUE<br>PASSENGERS | REVENUE<br>PASSENGER<br>MILES | LOSS PER<br>REVENUE<br>PASSENGER<br>(DOLLARS) | LOSS PER<br>REVENUE<br>PASSENGER<br>MILE<br>(DOLLARS) |
|--|--------------------|-----------------------|-------------------------------|---|---|
| Montreal/Toronto-Vancouver                   | 35,215,000         | 571,472               | 494,571,000                   | 61.62   | 0.07  |
| Sydney-Truro-Halifax                         | 858,000            | 56,418                | 7,912,000                     | 15.21   | 0.11  |
| Montreal-Halifax/Sydney                      | 16,960,000         | 720,795               | 229,386,000                   | 23.53   | 0.07  |
| Moncton-Saint John                           | 919,000            | 50,789                | 4,010,000                     | 18.09   | 0.23  |
| Montreal-Gaspé/Charney-<br>Edmunston-Moncton | 3,724,000          | 97,980                | 25,616,000                    | 38.01   | 0.15  |
| Richmond-Lyster-Quebec                       | 192,000            | 7,792                 | 243,000                       | 24.64   | 0.79  |
| Montreal-Sherbrooke-Coaticook                | 483,000            | 117,485               | 4,648,000                     | 4.11  | 0.10  |
| Quebec-LaMalbaie-Clermont                    | 211,000            | 15,386                | 829,000                       | 13.71   | 0.25  |
| Montreal/Quebec-Chicoutimi                   | 2,653,000          | 78,136                | 11,434,000                    | 33.95   | 0.23  |
| Quebec-Cochrane/Noranda                      | 3,700,000          | 74,826                | 12,858,000                    | 49.45   | 0.29  |
| Deux Montagnes-Grenville                     | 74,000             | 269                   | 10,000                        | 275.09  | 7.40  |
| Montreal/Brockville-Toronto                  | 7,922,000          | 1,181,774             | 296,692,000                   | 6.70  | 0.03  |
| Ottawa-Brockville/Toronto                    | 1,390,000          | 146,427               | 10,345,000                    | 9.49  | 0.13  |
| Ottawa-Belleville-Toronto                    | 388,000            | 24,654                | 5,646,000                     | 15.74   | 0.07  |
| Toronto-Kingston                             | 254,000            | 59,584                | 7,125,000                     | 4.26  | 0.04  |
| Toronto-Stouffville                          | 327,000            | 66,786                | 1,301,000                     | 4.90  | 0.25  |
| Toronto-Niagara Falls                        | 1,066,000          | 234,845               | 12,949,000                    | 4.54  | 0.08  |
| Toronto-Windsor                              | 3,494,000          | 726,789               | 96,857,000                    | 4.81  | 0.04  |
| Toronto-Guelph                               | 389,000            | 170,773               | 2,894,000                     | 2.28  | 0.13  |
| Toronto-Stratford                            | 427,000            | 76,062                | 3,688,000                     | 5.61  | 0.12  |
| Toronto-Sarnia                               | 2,692,000          | 445,459               | 33,446,000                    | 6.04  | 0.08  |
| Toronto-North Bay-<br>Kapuskasing            | 1,509,000          | 100,295               | 17,999,000                    | 15.05   | 0.08  |
| Montreal-Ottawa                              | 2,084,000          | 248,220               | 27,308,000                    | 8.40  | 0.08  |
| Hornepayne-Manitouwadge                      | 55,000             | 393                   | 29,000                        | 139.95  | 1.90  |
| Hearst-Nakina                                | 37,000             | 1,109                 | 88,000                        | 33.36   | 0.42  |
| Sioux Lookout-<br>Thunder Bay North          | 50,000             | 2,387                 | 260,000                       | 20.95   | 0.19  |
| Winnipeg-Thunder Bay North                   | 453,000            | 8,041                 | 1,471,000                     | 56.34   | 0.31  |
| Winnipeg-Thompson/Churchill                  | 5,221,000          | 55,931                | 16,343,000                    | 93.35   | 0.32  |

TABLE XVII-3 (Cont.)

|                                   | LOSS        | REVENUE<br>PASSENGERS | REVENUE<br>PASSENGER<br>MILES | LOSS PER<br>REVENUE<br>PASSENGER | LOSS PER<br>REVENUE<br>PASSENGER<br>MILE |
|-----------------------------------|-------------|-----------------------|-------------------------------|----------------------------------|--|
|                                   | (DOLLARS)   |                       |                               | (DOLLARS)                        | (DOLLARS)                                |
| Dauphin-Winnipegosis              | 14,000      | 8                     | 260                           | 1750.00                          | 53.85                                    |
| The Pas-Lynn Lake                 | 82,000      | 9,185                 | 2,115,000                     | 8.93                             | 0.04                                     |
| Flin Flon-Osborne Lake            | 40,000      | 1,111                 | 36,000                        | 36.00                            | 1.11                                     |
| Wabowden-Gillam-Churchill         | 30,000      | 1,422                 | 235,000                       | 21.10                            | 0.13                                     |
| Saskatoon-The Pas                 | 252,000     | 7,967                 | 1,532,000                     | 31.63                            | 0.16                                     |
| Prince Albert-Hudson Bay          | 30,000      | 360                   | 24,000                        | 83.33                            | 1.25                                     |
| Edmonton-Drumheller               | 326,000     | 21,984                | 1,581,000                     | 14.83                            | 0.21                                     |
| Edmonton-North Battleford         | 528,000     | 23,035                | 2,719,000                     | 22.92                            | 0.19                                     |
| Edmonton-Grand Centre             | 346,000     | 13,081                | 1,428,000                     | 26.45                            | 0.24                                     |
| Jasper-Prince Rupert              | 2,677,000   | 33,108                | 12,039,000                    | 80.86                            | 0.222                                    |
| McBride-Prince George             | 79,000      | 1,547                 | 89,000                        | 51.07                            | 0.89                                     |
| Regina-Saskatoon-Prince<br>Albert | 581,000     | 13,182                | 1,632,000                     | 44.07                            | 0.36                                     |
| Montreal-Quebec                   | 2,360,000   | 192,228               | 31,120,000                    | 12.28                            | 0.08                                     |
| TOTAL                             | 100,093,000 | 5,659,095             | 1,380,508,000                 | 17.69                            | 0.07                                     |

TABLE XV11-4

CANADIAN PACIFIC

PASSENGER SERVICE LOSSES

1972

|                          | LOSS       | REVENUE<br>PASSENGERS | REVENUE<br>PASSENGER<br>MILES | LOSS PER<br>REVENUE<br>PASSENGER | LOSS PER<br>REVENUE<br>PASSENGER<br>MILE |
|--------------------------|------------|-----------------------|-------------------------------|----------------------------------|--|
|                          | (DOLLARS)  |                       |                               | (DOLLARS)                        | (DOLLARS)                                |
| Mtl/Tor/Vancouver        | 18,561,000 | 302,791               | 232,307,000                   | 61.30                            | 0.08                                     |
| Halifax-Yarmouth         | 484,000    | 42,440                | 3,226,000                     | 11.40                            | 0.15                                     |
| Montreal-St. John        | 2,107,000  | 52,032                | 12,045,000                    | 40.49                            | 0.18                                     |
| Mtl/Quebec               | 1,303,000  | 135,320               | 15,684,000                    | 9.63                             | 0.08                                     |
| Mtl/Mont Laurier         | 141,000    | 18,625                | 1,321,000                     | 7.57                             | 0.11                                     |
| Montreal-Ottawa          | 344,000    | 81,255                | 4,851,000                     | 4.23                             | 0.07                                     |
| Toronto/Hamilton         | 202,000    | 16,582                | 632,000                       | 12.18                            | 0.32                                     |
| Toronto/Havelock         | 256,000    | 89,609                | 2,918,000                     | 2.86                             | 0.09                                     |
| Sudbury-White River      | 418,000    | 15,293                | 915,000                       | 27.33                            | 0.46                                     |
| Sudbury-Sault Ste. Marie | 334,000    | 6,854                 | 818,000                       | 48.73                            | 0.41                                     |
| Calgary-Edmonton         | 666,000    | 26,357                | 3,889,000                     | 25.27                            | 0.17                                     |
| TOTAL                    | 24,816,000 | 787,158               | 278,606,000                   | 31.53                            | 0.09                                     |

Each passenger on the rail service between Winnipeg and Thunder Bay via Fort Frances represented a \$56.00 loss. The bus fare is only \$15.50; the air fare is only \$41.00. Completely parallel bus service exists between Edmonton and Calgary; the railway loss, on that route after taking the revenue, was about \$25.00 per passenger for C.P. The bus fare is \$7.50 and the air fare is \$22.00. On the Montreal-St. John route, and the Montreal Halifax-Sydney routes, standard fare paid by the rail passenger combined with the loss suffered by the railway was also greater than the air fares between these points.

On the high density routes for which rail-passenger service is most suited, the loss figures were still substantial - Toronto to Montreal, \$6.00 a passenger (2¢ a mile); Toronto-Windsor \$4.80 a passenger (4¢ a mile); C.P. Montreal-Ottawa, \$4.23 a passenger (7¢ a mile). Some of these, however, are figures that might conceivably be absorbed into a fare structure under balanced competitive conditions if improved rail service is developed.

Some very simple analyses have been undertaken relating to the present subsidies and likely results under a goal of self-sufficiency. A theoretical 265 mile rail route was set up - an efficient travel distance for rail - at an assumed volume of 3,200 seats a day each way. Various equipment combinations were tested and the results calculated in terms of actual costs per seat mile. Necessary revenues were also calculated assuming a 50% load factor implying a passenger volume of 1,600 per day in each direction. The results (Table XVII-5) indicate that under the most likely combinations, either modified improved types of current equipment, the new LRC type equipment now under test, or high speed electric (a later possibility), a yield of  $5\frac{1}{2}$ ¢ to  $6\frac{1}{2}$ ¢ a mile would be needed on a full cost

TABLE XVII - 5

REQUIRED REVENUE FOR IMPROVED RAIL SERVICE

| <u>EQUIPMENT TYPE</u>           | <u>REQUIRED REVENUE<br/>PER SEAT-MILE<br/>(CENTS)</u> |                      | <u>REQUIRED REVENUE<br/>PER PASSENGER-MILE<br/>AT 50% LOAD FACTOR<br/>(CENTS)</u> |                      |
|---------------------------------|---|----------------------|---|----------------------|
|                                 | <u>Incremental<br/>Cost</u>                           | <u>Full<br/>Cost</u> | <u>Incremental<br/>Cost</u>   | <u>Full<br/>Cost</u> |
| Intermediate Speed (TEMPO Type) | 2.1   | 2.7                  | 4.2   | 5.4                  |
| High Speed Diesel (LRC Type)    | 2.6   | 3.3                  | 5.2   | 6.6                  |
| High Speed Electric             | 2.5   | 3.0                  | 5.0   | 6.0                  |

- Assumptions:
1. 8 Departures per day.
  2. 400 Seats per train.
  3. 50% Load factor.

(including roadbed improvement and general overhead costs but no direct allocation against present investment in roadbed). Standard fare would have to be somewhat higher to achieve these yields. This fare level is reasonable.

As passenger volume drops, the capital investments needed to provide high speeds have to be spread over a smaller number of passengers. A sensitivity analysis of required revenue for the high speed diesel case under different assumptions of passenger volume and frequency is shown in Table XVII-6. At volumes less than 500 passengers per day, the costs per passenger-mile becomes unrealistically high, over 10¢ per passenger mile.

The actual rail and total passenger flows in 1972 were examined to determine the routes which potentially could support improved rail service if a considerable proportion of automobile and other passengers were diverted to rail. Assuming that somehow rail volume could be increased by fifty percent (equivalent to a shift of 3% auto to rail). A number of routes within the high-density corridor between Windsor and Quebec (the Canadian Corridor) were identified as possibly being self-supporting. Additional detailed work on the effects of volume change and distance factor is continuing.

As for the balance of the rail-passenger movement it is wasteful and costly and, since in most cases alternative modes exist, unnecessary in that sense. Longer haul routes which seemed to have good volume on examination really seem to have seasonal potential only. On the other hand, tradition and emotion regarding the past role of passenger-rail, labour union reactions of major nature, excessive public expectations built up by misunderstanding and press comment; all combine to indicate that sudden change could be difficult. What is needed is a process over a

TABLE XVII - 6

REQUIRED RAIL PASSENGER REVENUE AT DIFFERENT FREQUENCIES

| <u>DEPARTURES<br/>PER DAY</u> | <u>TOTAL SEATS<br/>PER DAY</u> | <u>TOTAL PASS-<br/>ENGERS PER<br/>DAY</u> | <u>REQUIRED REVENUE<br/>PER SEAT-MILE<br/>(CENTS)</u> |                      | <u>REQUIRED REVENUE<br/>PER PASSENGER-MILE<br/>AT 50% LOAD FACTOR<br/>(CENTS)</u> |                      |
|-------------------------------|--------------------------------|---|---|----------------------|---|----------------------|
|                               |                                |   | <u>Incremental<br/>Cost</u>                           | <u>Full<br/>Cost</u> | <u>Incremental<br/>Cost</u>   | <u>Full<br/>Cost</u> |
| 8                             | 2800                           | 1400                                      | 2.6   | 3.2                  | 5.2   | 6.4                  |
| 6                             | 2100                           | 1050                                      | 3.0   | 3.7                  | 6.0   | 7.4                  |
| 4                             | 1400                           | 700                                       | 3.9   | 4.7                  | 7.7   | 9.5                  |

- Assumptions:
1. High speed diesel equipment
  2. 350 Seats per train
  3. 50% Load Factor.

period aimed at elimination of service where reasonable alternatives exist and a requirement that on what remains railways achieve self-sufficiency or some much greater degree thereof - possible only on some high density routes with perhaps the "excursion" technique on some long-haul routes. If the government does not accept full self-sufficiency as a target in its passenger transportation policy then at least the assistance to rail should not be relatively much greater than to buses and aviation as it now is.

In this connection, the railways argue that the provisions of the National Transportation Act which require the railways to bear 20% of passenger service losses are unfair and ask for 100% subsidy in place of the 80% in the Act for any continuing service. They point out, that underlying the original provision of the Act, was the expectation that passenger-rail services would immediately be rationalized, moving in the direction of self-sufficiency with abandonments taking place, rather than virtually frozen as has been the case during the last few years.

One point mentioned elsewhere needs to be mentioned again. Even in cases where no reasonable alternative to rail presently exists, existing passenger service in a number of cases could be better organized and provided either by use of bus or bus and rail combined. Present separate modal approaches in the passenger field, present legislation and present separate provincial of jurisdiction over road are impediments.

There is a urgent aspect that requires some policy direction from the government regarding the future of rail passenger services. Abandonment of passenger rail services is under the jurisdiction of the Canadian Transport Commission and the National Transportation Act requires periodic five-year review of subsidized service; the statutory period is such that the Commission must initiate the review this summer commencing with the

transcontinental services. It would be unfortunate if this process were undertaken without some indication of government policy.

### CONCLUSIONS

The main courses open are:

- 1) Maintain the present situation. In this event passenger rail subsidies will continue to rise with losses moving towards the \$400 million figure by 1980; and if efforts are added to provide better equipment, large additional capital expenditures by government will be needed in support as well as operating subsidies.
- 2) Establish a goal of self-sufficiency for rail passenger service to be achieved over a fixed period of years (say 5) recognizing that this will mean major changes, with service remaining in some cases where no other reasonable alternative exists particularly in some developmental or "remote" situations and , hopefully, improved service in some cases of high density inter-city service; and possibly some seasonal service on an "excursion" or "tour" basis long-haul.
- 3) Settle on some minimum level of subsidy per passenger-mile much lower than the present and work to this target. A figure of 2¢ would suggest roughly equivalent treatment to air but would leave both with support not now accorded the bus industry and hamper its potential for growth.

The consequences of the first alternative are costly and would involve continuation of services where better and cheaper alternatives are available. It would also involve inequitable treatment of the air and bus modes and hamper development of their roles - unless greater subsidies were given

to them. Moreover, it would be difficult under this course to maintain the principle that the government should pay only 80% of passenger losses. The principles of the N.T.A. itself indicate that, under a continuing policy of "imposed" operation, the government should assume 100% of loss.

The second alternative would, of course, be postulated on setting the goal of self-sufficiency for the other modes already apparently achieved for motor coach and would not only release funds for alternative developmental use but would establish a fairer base for the commercial competitive relationship between all three modes.

The same would be true of the third alternative, except that any substantial reduction in the level of rail-passenger subsidy would result in elimination of most of the rail-passenger services anyway because their subsidy level is so high; and would make more difficult the achievement of optimum modal balance.

In any case, the first steps to be taken would be similar under alternatives two or three since a phased approach, including Canadian Transport Commission review as required by the National Transportation Act would be required. Moreover, this phased approach would also be necessary if the same commercial objective is accepted for other modes, particularly air and the private auto; and full prospect of achievement could be reassessed in three to five years.

An interim rail-passenger approach could centre around review of all present services to consider whether:

- (a) need exists that cannot be served adequately and either more cheaply or on a basis of self-sufficiency by the bus mode (or on long-haul, the air mode as well): In these cases if rail service has to be maintained possibly it could be provided more cheaply by equipment or frequency change.

- (b) prospects of a particular route achieving self-sufficiency within a specified period - say 5 years.
- (c) re-adjustment of services aimed at a combination of abandonment now, temporary retention pending introduction of alternatives and the "use or lose theory"; and rate adjustments to cover costs.

#### RECOMMENDATIONS

It is recommended that the second alternative, commercial sufficiency be accepted as a target for rail-passenger services.

Because the Canadian Transport Commission must by law, initiate review of this matter this year, early decision on this issue is required.

If this approach is accepted immediate steps would be needed to:

- (a) establish a working group of representatives of the Ministry, the Canadian Transport Commission and of Finance and Treasury Board to develop a plan of approach, and to develop a governmental directive to the C.T.C. as a guideline for its required review.
- (b) It is also recommended that part of this approach should involve plans to ensure a fair trial of an improved rail service aiming at self-sufficiency on a selected route or routes within the high density corridor. Only by this means can the ability of rail-passenger service to compete successfully without subsidy be tested and data obtained regarding degree of density needed and passenger preference.

C. AVIATION INFRASTRUCTURE: IMPLICATIONS FOR COST RECOVERY

Adoption of a policy of self-sufficiency in full or to a major degree in the air mode suggests consideration of a special authority to operate the major part of the aviation infrastructure. The establishment of an Air Administration within the Ministry of Transport was a first step in this direction. It has made good progress development of revenues. However, total pressures for cost-efficiency and productivity that go with a commercial corporate structure aimed at achieving self-sufficiency are lacking as well as the flexibility for rapid adjustment and decision that is difficult to achieve within a governmental framework.

The corporation should not establish for itself a higher target return on investment or assets than the governmental authorities are prepared to accept as reasonable for the carriers. It should include those airports providing service in a "mature" area and not included in the "development" class. Consideration should be given to including under the authority systems such as en route aids to navigation and traffic control.

Numerous questions, difficult and easy, would need to be examined. Should land value be included on an investment or a present value basis? Should the present complex approach to airfield charges undergo major change and simplification?

The most important issues will relate to:

- (a) treatment of system services as distinct from airports.
- (b) the role of the customer or "user".

(a) System Services

An airport and its associated facilities can fairly easily be identified for purpose of charges in relation to use. However, certain system services have to be treated as a whole; airways traffic control, en route navigation aids, the aviation weather support. Even the first two of these will have to be examined to determine whether terminal services should be separated and added to airport costs or included as part of service system costs.

More difficult, outside the airport structure, will be the apportionment of costs between commercial carriers and general aviation including government aircraft. At an airport, a large aircraft places greater burden on a runway than a very small one - and on terminal capacity. En route, the small aircraft is just one more unit using air traffic control, radio aids and weather service, and can put the same load on a system as a large commercial plane. It would be unfair to charge commercial aviation for more than its share of system costs but the data suggests it may not now be bearing a share proportionate to that of the commercial carrier.

(b) The Role of the Customer Airlines

Adoption of a self-sufficiency goal will require a change in the attitude of the provider of facilities and services. While carriers and general aviation have been consulted and allowed to make representations in regard to airports and terminals, the governmental authorities have retained the major role in deciding what should be provided. There has not been a customer relationship

(b) (Continued)

in which supply is closely related to customer demand as related to price. Canada has evolved an excellent and costly air traffic control system and has plans for further expensive technical additions and improvements. These may be desirable but not absolutely essential and, within any target of full cost-recovery, the customers will need to be given, if not sole right of decision, at least a new major role in regard to costly expansions. This will require a change in the traditional approach at governmental level, and great care that technical excellence is not promoted under a guise of safety; and perhaps more modest and less expensive aspirations in some areas.

Also the new approach means that the customers, in some cases, might be permitted to provide certain facilities or services of a type provided hitherto by government. Buildings are the easiest example, even including terminals.

#### RECOMMENDATION

It is recommended that, if the government accepts a goal of full or substantially greater self-sufficiency, a corporate authority be set up to operate major airports and the airways system; and that, because of the complexities in this situation, immediate action in planning be undertaken.

SECTION XVIII: THE ROLE OF GOVERNMENT

A. REGULATION

Since more detailed comment will be available as part of the total transportation task force report, this section limits itself to highlights of fact and comment.

The constitutional authority of the federal government applies to all regulation of the air mode. In the rail mode and in the bus mode, federal authority applies to inter-provincial operations. The dominance of C.N.R. and C.P.R., including passenger movement, compared to purely provincial railways (primarily B.C., and Ontario and Quebec), plus the high cost of entrance in the rail area give the federal government effective power in rail matters sufficient to give whatever national leadership may be decided on in any particular situation.

The federal government has not exercised its authority over inter-provincial road movement although Part III of the National Transportation Act provides for this. In consequence, there are ten different provincial regulatory systems for commercial road transport and although there is some consultative machinery between provinces, regulatory policies and standards differ from province to province.

Lack of action at the federal level appears to arise from failure to resolve differences both at federal level and between the federal and provincial representatives as to extent of federal jurisdiction to be exercised, and the role to be accorded to provincial authorities within any federal framework of road regulation.

While not challenging the federal jurisdiction over inter-provincial transportation, the provinces have been indicating interest in a greater

provincial role in regulation and planning of transportation activities lying solely within provincial boundaries. This is evidenced by their wish for a major role in any federal regulation of road transport; by statements from some provinces suggesting intra-provincial air transport should be under provincial control; and by direct activity in aviation planning and rail planning in some provinces. Regulation normally includes:

- (a) entry to the field - i.e., authority to offer service and definition of routes and points of call
- (b) abandonment of service
- (c) some form of control of rates varying in degree of flexibility in the control process
- (d) standards of service in the broad sense of total adequacy and frequency
- (e) safety standards

The segmentation in the road area has already been noted. In the railway passenger area, the prime problems for the Canadian Transport Commission are abandonment; i.e., what should be done about the uneconomic and heavily subsidized railway passenger route structure; current economic and technical conditions which are pointing towards greater and more frequent rate increases than in the past; and the extent to which rate jurisdiction should be active in terms of complete control over all rate changes or limited to cases where obvious protection is needed for the passenger because no truly competitive choice is open to him.

This same concern with the type and extent of jurisdiction over rate changes is emerging in the air transport field. Jurisdiction of the C.T.C. over entry to and departure from services or routes is adequate for

effective control. It is limited in regard to Air Canada because of the provision that the C.T.C. must license Air Canada to perform services which the government decided should be performed by the crown carrier. However, if the concept described later, that the government should have authority to set down broad lines of policy for the regulatory authority to follow is accepted, then any apparent anomaly with regard to C.T.C. regulatory jurisdiction over Air Canada licences diminishes greatly in importance.

The extent of jurisdiction over what may loosely be described as passenger service standards, and the manner in which any jurisdiction is exercised, do not appear to be major problems at government level, at carrier level or at public level. Any approach to this subject has to be on a broad basis; internal details of handling procedures or service should be left to the carrier. The recent examination of the adequacy of air services in the Atlantic provinces undertaken at the request of the Minister of Transport by the C.T.C., represents the desirable use of this broad regulatory authority over service adequacy.

As for the safety standards, these are an essential part of any regulatory process. There must be some interplay between the economic impact of safety requirements and social demand and public acceptance. Experience on a wide international front has demonstrated that the special nature of this subject requires that it be administered separate from rather than as part of the economic regulatory process. At the federal level, this is already the case with the air mode; and while it is not the case in the rail mode, it is understood that change is now contemplated.

B. RESPONSIBILITY FOR PLANNING AND ADVICE ON POLICY

No matter what balance may be struck between reliance on commercial market forces to achieve optimum results in passenger movement, use of the regulatory process and imposition of positive government planning, there has to be a strong and competent source for policy advice to the Minister of Transport. This source needs to be well supported in terms of research capability.

In fact, lack of clarity and duplication exists in this regard. When the National Transportation Act was approved, the Canadian Transport Commission was given the obligation of advising the Minister on a whole range of matters relating to transportation policy. So extensive were these that the Commission, in effect, became charged with the responsibility of advising the Minister over the whole range of transportation matters. This was not a permissive authority but an obligatory responsibility.

The reasons for this being done at the time, arose from two situations of current concern. A long period of dissatisfaction on the part of both the government and the Minister with previous regulatory bodies, particularly the Board of Transport Commissioners which dealt with the railways, suggested that the regulatory process was too narrow in its outlook, too much bound by tradition, and not sufficiently conscious of the need to evolve new and broader policy directions. Charging the Canadian Transport Commission with the need to advise on policy matters was designed to force the regulatory authority to operate in a broader framework of policy consciousness.

The second factor was the concern that had emerged over a period of time with regard to heavy and complex administrative responsibilities of

the then Department of Transport and the associated operational agencies. There was a tendency to feel, both within some areas of government and of Parliament that the burden of administrative responsibility was so great and so complex that it must always hamper the proper amount of emphasis on policy formulation and advice.

The belief that these weaknesses would be corrected by limiting the policy responsibility of the department and in fact giving the C.T.C. primacy in this regard, has not worked in practice. It is not necessary, within this report, to comment in detail on why this has been the case. However, there is considerable experience and competent judgement, both in this country and other countries, which suggests that association of a major and broad policy responsibility with the functions of a regulatory agency will not work well in practice.

The situation was further complicated by the later transformation of the Department of Transport into a Ministry structure. This eased one of the problems mentioned in connection with the original National Transportation Act since the heavy administrative responsibilities of the department were re-organized in a manner which would permit greater attention to policy matters at senior level. The fact remained however, that the prime statutory responsibility for policy advice rested with the Canadian Transport Commission. It is reasonable to assume that the Commission found new problems associated with its policy advice role with the emergence of the Ministry concept. The Ministry too was handicapped; quite apart from the legal situation, a purely pragmatic reaction to be expected from Treasury would be concern over new transportation research organizations, staff and expenditure. Much greater staff support for research in support of policy exists in the Commission compared with the Ministry.

In summary then, the situation as it exists at present, is that the Minister quite properly seeks a major portion of his policy advice from the Ministry. On the other hand, the Commission has the statutory responsibility to provide policy advice and has a substantial support organization for this purpose.

One further feature of this situation merits comment. The Minister and the government in the final analysis have the ultimate responsibility for policy. It is not unusual when governments establish regulatory agencies to see conflict emerge subsequently as to the respective roles of the regulatory agency and the government in the matter of responsibility for policy. Unless policy is clearly laid down in the statute within which the regulatory agency in its decisions should operate in accordance with policies issued from time to time by the government, situations will emerge in which the regulatory agency by its decisions may, in effect, formulate major policy.

When, as in this case, prime responsibility for policy is placed on the regulatory agency, and when, as shown elsewhere in this report, the principles to govern transportation policy while reasonable as far as they go are incomplete, then the confusion with regard both to advice on formulation of policy and actual responsibility for policy formulation is increased. These issues need clarification.

C. FEDERAL-PROVINCIAL CO-OPERATION IN TRANSPORTATION POLICY  
PLANNING AND IMPLEMENTATION

The current situation represents a major change from that which prevailed only a few years ago. Looking back to the fifties and the sixties, no consistent practice or strong tradition existed with regard to continuing consultation between federal and provincial authorities on major transportation matters. Consultation did take place and fairly often, in regard to specific ad hoc situations and problems. Reasons can be found in the considerable difference in the atmosphere at that time. The provinces themselves were much less interested in a broad consultative role in conjunction with the federal government, and indeed, showed suspicion upon occasion that federal consultation with them might be designed to achieve undesirable involvement. Similarly, the federal authorities, while not adverse to particular consultation on individual issues, were inclined to feel that a broad pattern of consultation might hamper federal freedom of action. Consultations at the official level between federal and provincial authorities were not discouraged but neither were they encouraged on any broad basis and informal proposals that emerged from time to time regarding some continuing forum for consultation on either transportation generally or specific areas of transportation were not actively developed for the reasons indicated above.

Major change has taken place within the last decade and particularly within the last few years. In place of occasional consultations between a federal Minister of Transport with some appropriate provincial minister on a particular issue, supplemented by somewhat more frequent but still specific consultations at the official level, there has been gradual evolution of a consultative process which has involved more frequent

contacts between the federal Minister of Transport and the equivalent provincial ministers; and between senior officials at both the federal and provincial level. The formal organization surrounding the contact between the federal government and the western provincial governments in connection with the Western Economic Opportunities Conference represented a major move towards formal machinery not limited solely to the field of transportation. Relevant to the evolution of a comprehensive passenger policy is the best method of providing the appropriate framework for a combination of continuing formal and informal consultation and planning between the federal transportation authorities and those at the provincial level.

D. PUBLIC PARTICIPATION IN THE PROCESS OF DECISION

Just as the atmosphere has become more favourable for consultation with the provinces, a greater public interest has emerged in recent years in participation in the process leading to important government decisions. This changing social environment is recognized in the recent government statement of priorities which indicated the need to satisfy this requirement.

It can emerge in two different sets of circumstances; the first relates to major policy decisions taken outside the regulatory process itself.

Examples from the first category can be found within recent Ministry experience; public hearings on major airport developments. Situations of this sort are most likely to arise with reference to major new physical facilities although they could emerge in relation to a major new policy direction. No hard and fast rule can be laid down on these situations.

The degree of public impact and the degree of public interest balanced against the time-frame for necessary action must be the governing factors in decision on public participation in the process. The recent record of the Ministry in this regard indicates recognition of this need. The format for response may vary, but in most cases it is not likely to involve a government representative acting on behalf of the public at large although expenditure of public funds may be required to ensure adequate public participation. The principle of public participation, however, should be recognized.

The same need exists within the regulatory process but emerges in different form. The Canadian Transport Commission has full authority to deal with matters under its jurisdiction by way of public hearing but wide discretion as to how it may employ the public hearing process. It should not be subject to hard and fast rules because in each case a balancing of judgement is necessary. Excessive use of the hearing technique, with prolonged delays, may disrupt carrier operations and harm needed public service while at the other extreme, lack of reasonable opportunity to inform the public and receive views can be unfair.

The situation has been complicated within the regulatory processes by the expected tendency for public participation, in the past, to take a standard and rather narrow approach - always against rate increases or decline of service regardless of economics or traffic; always for more service or more competition regardless of costs or broad consequences; usually a position of opposition to or confrontation with the carrier(s) principally involved. Major provincial interventions in railway cases have usually, but not always followed this pattern in part at least, but have been well prepared compared to the normal public intervention.

Large special interests will have the resources to take care of themselves within the public hearing process and the Canadian Transport Commission itself has been showing increasing recognition of the need to find means by which the public can participate in major cases. The problem is how to ensure adequate representation for the ordinary passenger or individual small user, - the public at large.

The National Transportation Act has made provision for a government legal department to act as a "public representative", but, although this is in the law, the department has been unable to assume this role for reasons which apparently have not found unanimous support at federal level. In the absence of this sort of representation in accordance with the provisions of the Act, and of any other generally accepted solution, improved recognition of the principle of public participation has not yet been achieved.

#### RECOMMENDATIONS

1. The achievement of a total transportation policy requires federal exercise of its regulatory authority over all modes; Part III of the National Transportation Act should be implemented in regard to the motor coach mode.
2. The prime responsibility for advice on policy to the Minister, including research support, should legally rest with the Ministry, not the Canadian Transport Commission, including research capability.
3. As a supplement to redefinition of policy principles in the National Transportation Act, the Minister should have and use authority to issue policy directives to regulatory or operating entities reporting to him, consistent with the principles in legislation.

4. Formal machinery for policy co-ordination and planning between the federal and provincial governments is required.
5. Starting with the provisions now in the National Transportation Act, further action is needed, including review of the governmental role there defined, to improve the process for public participation in aspects of the regulatory process dealing with major policy issues.

SECTION XIX: SUMMARY OF RECOMMENDATIONS

A number of recommendations have been made within the sections of the report. These recommendations have been repeated below under the section headings:

PASSENGER TYPES: TRAVEL PEAKING

1. Transportation services must provide adequate capacity to satisfy the total market, commercial and non-commercial, but in the broad sense described where necessary, some priority should be given to satisfaction of the business market.
2. Action to develop, starting with the air mode since it is under federal jurisdiction, a policy which encompasses both scheduled and charter service and provides guidelines for balanced between the two.
3. In the longer run, some consideration of the implications of continuing to attempt to meet the service requirements for transportation at summer peak arising from the steady increase in this peak compared to the year-round average.
4. In the relationships between peaking and infrastructure planning, not enough research has taken place to suggest a solution but two elements require further study:
  - (a) the targets which should realistically be set  
for catering to peak demand in terms of

infrastructure provided by government;

- (b) the methods by which user charges might be adapted to peak demand to avoid penalization of users during periods outside the seasonal peak.

- 5. As a basic policy, given the great variations in the travel pattern, it would be unwise to adopt a policy that Canadian Transportation should be expected to cater fully to these peaks. Without a great deal more detailed analysis, it would be impossible to determine whether any quantitative formula could be developed which would suggest target levels. This justifies further study.
- 6. Assuming some continuing forum for federal-provincial (and municipal) consultation on transportation emerges, a more detailed analysis of this subject along with educational effort aimed at long-term improvement by changing some of those conditions which can be adjusted and which create peaking should be undertaken.
- 7. Within the regulatory process, positive encouragement should be given to pricing and marketing programmes designed to level peaks.

### OWNERSHIP OF CARRIER OPERATIONS

1. Canada should continue to rely on a combination of public and private ownership in satisfying the passenger needs of the public. To ensure the achievement of governmental objectives, the government in its current areas of active jurisdiction should, where necessary, continue to support the position of the public carriers as prime vehicles to ensure the achievement of total transportation policy and satisfactory use of transportation as an instrument to support national policies.
2. Ownership and control of major commercial transportation entities should be Canadian and, if necessary, legislative and regulatory action taken to ensure this objective.

### COMPETITION

1. Competition is a major instrument in regard to both cost-efficiency and competitive rates, but not sufficiently all-embracing to justify placing full reliance on it in the field of rates. Its best effectiveness cannot be achieved unless the modes are placed on a basis of equal treatment.

### INTER-MODAL COORDINATION

1. Action needs to be taken to ensure that the regulatory authority has the necessary authority and is directed to approach all passenger modes as part of a single whole in resolving passenger issues which come before them; and supplementary action to provide, within the Ministry, policy support for inter-modal planning, and monitoring

which will ensure an integrated approach, including advice on investment allocation and equitable treatment of modes; to be complete this should in some form involve provincial participation.

#### CARRIER OPERATIONS

1. The government should accept the principle of commercial self-sufficiency in terms of a reasonable measure of profitability for the common carriers, both to avoid unnecessary financial burdens on government and as one means of ensuring reasonable economic efficiency. The details of any utilization in relation to the rate-making process would be developed later.
2. As part of this general approach, action should be taken with the crown-owned carriers to establish a much more reasonable relationship between equity and debt in their financial structures.
3. Subject to the decision to be taken in regard to the economic position of infrastructure provided by government, including the user charge issue, the same principle of a target profitability should be applied to the operation of these facilities.
4. If a reasonable relationship is to be maintained between costs and fares, the nature of the cost taper over distance should be reflected adequately in the fare structure.

MODAL ROLES

1. The need to achieve more efficient private automobiles and more efficient use thereof, which appears to be implicit in governmental policies at all levels, should be broadened to include a gradual and modest transfer of passengers from the private auto to inter-city commercial carriers. An objective of from 5% to 10% may not be unreasonable and would over a period of years have minimal impact on the total industry given normal growth rates. The means by which this can be achieved as well as the degree and rate should be prime subject for consultation between federal and provincial authorities as part of a total transportation programme.
2. Within the framework of service now provided by all commercial modes the motor-coach needs to be given more active consideration in federal planning.
3. Achievement and maintenance of a national carrier structure by mode represents a desirable objective.

A POLICY FOR PASSENGER PRICING

The following principles in passenger pricing are recommended:

A. Principles

- (a) Reliance on market pricing in circumstances where effective competitive relationships, whether inter-modal or intra-modal, exist; freedom of action to set fares in these conditions subject only to tariff filing.
- (b) Broad use of standard system charges with a cost-distance taper as a means of providing protection and stability in non-competitive conditions; each carrier to use this approach on its own system.
- (c) Broad requirement that discount fares be constructed in terms of a standard relationship to standard fares.
- (d) Protection of the user through process of public examination where necessary to ensure particular rates or tariffs comply with the foregoing principles.
- (e) Judgement based on comparable costs other than the carriers' own system costs to be a residual factor of assessment in any investigation of monopoly rates where reasonable comparable rates can be established.

The methods recommended to implement these principles are:

- (a) The regulatory authority could establish a general formula with lower and upper limits using the cost-distance taper approach. The formula should be flexible enough to recognize variations in types of service within a mode but should also place some limit on amount of cross-subsidization between and short long routes in a system.
- (b) Carriers could be required to file fares in accordance with the formulae. Filing should be accepted providing they comply, and also subject to freedom to set rates to meet competitive situations.
- (c) In cases of public complaint in regard to monopoly situations, carrier complaint in competitive situations, or if dissatisfied on its own account the regulatory authority should investigate using the principles described above, and also the general principles of the total transportation policy and if necessary postpone or disallow.
- (d) The regulatory authority should ensure that collusive activity does not take place in the matter of domestic tariff filings in competitive situations.

THE OBJECTIVE OF COMMERCIAL SELF-SUFFICIENCY

1. The principal of self-sufficiency in passenger modes should be accepted and a programme to achieve this over a five to ten year period initiated.
2. In determining realistic programmes of achievement, the commercial carriers should not be required to bear more than their fair share of total costs. Costs associated with non-commercial passenger movement should be apportioned suitably to general users.
3. Facilities and services, both existing and required in future, which are recognized and identified at government level as developmental in nature should be treated separately in terms of the total cost recovery programme.
4. It is recommended that commercial sufficiency be accepted as a target for rail passenger services. Because the Canadian Transport Commission must, by law, initiate review of this matter this year, early decisions on this issue are required.
5. If this approach is accepted, immediate steps would be needed to:
  - (a) establish a working group of representatives of the Ministry, the Canadian Transport Commission and of Finance and Treasury Board to develop a plan of approach, and to develop a governmental directive to the C.T.C. as a guideline for its required review.

5. (b) It is also recommended that part of this approach should involve plans to ensure a fair trail of an improved rail service aiming at self-sufficiency on a selected route or routes within the high density corridor. Only by this means can the ability of rail passenger service to compete successfully without subsidy be tested and data obtained regarding degree of density needed and passenger preference.
6. It is recommended that, if the government accepts a goal of full or substantially greater self-sufficiency, a corporate authority be set up to operate major airports and the airways system; and that, because of the complexities in this situation, immediate action in planning be undertaken.

THE ROLE OF GOVERNMENT

1. The achievement of a total transportation policy requires federal exercise of its regulatory authority over all modes; Part III of the National Transportation Act should be implemented in regard to the motor coach mode.
2. The prime responsibility for advice on policy to the Minister, including research support, should legally rest with the Ministry, not the Canadian Transport Commission, including research capability.
3. As a supplement to redefinition of policy principles in the National Transportation Act, the Minister should have and use authority to issue policy directives to regulatory or operating entities reporting to him, consistent with the principles in legislation.
4. Formal machinery for policy co-ordination and planning between the federal and provincial governments is required.
5. Starting with the provisions now in the National Transportation Act, further action is needed, including review of the governmental role there defined, to improve the process for public participation in aspects of the regulatory process dealing with major policy issues.











